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*Prepped by Charmelle Mathews*

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**ECONOMIC ANALYSIS OF THE  
PROPOSED RULE TO ADD  
CERTAIN INDUSTRIES TO  
EPCRA SECTION 313**

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Regulatory Impacts Branch  
Economics, Exposure and Technology Division  
Office of Pollution Prevention and Toxics  
U.S. Environmental Protection Agency

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June 1996

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Economics, Exposure and Technology Division  
Office of Pollution Prevention and Toxics  
U.S. Environmental Protection Agency

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## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	ES-1
<b>SUMMARY</b>	S-1
 <b>CHAPTER 1: BACKGROUND, STATEMENT OF NEED, STATUTORY AUTHORITY AND OVERVIEW OF ANALYSIS</b>	
<b>1.1 STATUTORY AND REGULATORY HISTORY</b>	1-2
1.1.1 Passage of EPCRA	1-2
1.1.2 Overview of TRI	1-2
1.1.3 Pollution Prevention Act	1-3
1.1.4 Changes to the List of Chemicals	1-3
1.1.5 Alternate Threshold	1-4
1.1.6 Executive Order 12856	1-4
<b>1.2 SUMMARY OF TRI REPORTING REQUIREMENTS</b>	1-4
1.2.1 Full-Time Employee Determination	1-5
1.2.2 Definition of a Facility	1-5
1.2.3 Threshold Determinations	1-5
1.2.4 Exemptions	1-5
1.2.5 Readily Available Data	1-7
1.2.6 Other	1-7
<b>1.3 PUBLIC ACCESS TO AND USES OF THE TRI DATA</b>	1-9
<b>1.4 STATEMENT OF NEED</b>	1-9
1.4.1 The Theory of Market Failure	1-10
1.4.2 The Effect of TRI Information on Market Failure	1-16
<b>1.5 STATUTORY AUTHORITY</b>	1-17
<b>1.6 PURPOSE AND SCOPE OF THIS REPORT</b>	1-18
<b>1.7 REGULATORY OPTIONS CONSIDERED IN THIS REPORT</b>	1-19
<b>1.8 ORGANIZATION OF THIS REPORT</b>	1-19
References	1-21
 <b>CHAPTER 2: ESTIMATES FOR NUMBER OF AFFECTED FACILITIES AND NUMBER OF REPORTS</b>	
<b>2.0 OVERVIEW OF INDUSTRIES</b>	2-1
<b>2.1 GENERAL METHODOLOGY</b>	2-1
2.1.1 Overview of the Methodology	2-2
2.1.2 Options Considered in the Analysis	2-3
2.1.3 Regulatory Alternatives	2-6
<b>2.2 SIC CODE 10 - METAL MINING</b>	2-7
2.2.1 Description of SIC code	2-7
2.2.2 Principal Activities	2-7
2.2.3 TRI Chemicals	2-7

	2.2.4	Results of the Analysis . . . . .	2-8
	2.2.5	Limitations of the Analysis . . . . .	2-9
<b>2.3</b>		<b>SIC CODE 12 - COAL MINING . . . . .</b>	<b>2-10</b>
	2.3.1	Description of SIC code . . . . .	2-10
	2.3.2	Principal Activities . . . . .	2-10
	2.3.3	TRI Chemicals . . . . .	2-10
	2.3.4	Results of the Analysis . . . . .	2-10
	2.3.5	Limitations of the Analysis . . . . .	2-13
<b>2.4</b>		<b>SIC CODE 14 - NONMETAL MINING . . . . .</b>	<b>2-13</b>
	2.4.1	Description of SIC code . . . . .	2-13
	2.4.2	Principal Activities . . . . .	2-13
	2.4.3	TRI Chemicals . . . . .	2-14
	2.4.4	Results of the Analysis . . . . .	2-14
	2.4.5	Limitations of the Analysis . . . . .	2-14
<b>2.5</b>		<b>SIC CODES 40 and 47 - RAILROADS AND TRANSPORTATION SERVICES . . . . .</b>	<b>2-16</b>
	2.5.1	Description of SIC code . . . . .	2-16
	2.5.2	Principal Activities . . . . .	2-16
	2.5.3	TRI Chemicals . . . . .	2-16
	2.5.4	Results of the Analysis . . . . .	2-17
	2.5.5	Limitations of the Analysis . . . . .	2-17
<b>2.6</b>		<b>SIC CODE 42 - TRUCKING AND WAREHOUSING . . . . .</b>	<b>2-18</b>
	2.6.1	Description of SIC code . . . . .	2-18
	2.6.2	Principal Reportable Activities and TRI Chemicals . . . . .	2-18
	2.6.3	Limitations of the Analysis . . . . .	2-22
<b>2.7</b>		<b>SIC CODE 45 - AIR TRANSPORTATION . . . . .</b>	<b>2-22</b>
	2.7.1	Description of SIC code . . . . .	2-22
	2.7.2	Principal Activities . . . . .	2-23
	2.7.3	TRI Chemicals . . . . .	2-23
	2.7.4	Results of the Analysis . . . . .	2-23
	2.7.5	Limitations of the Analysis . . . . .	2-24
<b>2.8</b>		<b>SIC CODE 46 - PIPELINES . . . . .</b>	<b>2-24</b>
	2.8.1	Description of SIC code . . . . .	2-24
	2.8.2	Principal Activities . . . . .	2-25
	2.8.3	TRI Chemicals . . . . .	2-25
	2.8.4	Results of the Analysis . . . . .	2-25
	2.8.5	Limitations of the Analysis . . . . .	2-26
<b>2.9</b>		<b>SIC CODE 49 - ELECTRIC, GAS, AND SANITARY SERVICES . . . . .</b>	<b>2-26</b>
	2.9.1	Description of SIC code . . . . .	2-26
	2.9.2	Principal Activities, TRI Chemicals, and Estimated Reporting . . . . .	2-27
	2.9.3	Limitations of the Analysis . . . . .	2-36
<b>2.10</b>		<b>SIC CODES 50 AND 51 - WHOLESALE TRADE . . . . .</b>	<b>2-36</b>
	2.10.1	Description of SIC code . . . . .	2-36
	2.10.2	Principal Activities and TRI Chemicals . . . . .	2-37
	2.10.3	Results of the Analysis . . . . .	2-38
	2.10.4	Limitations of the Analysis . . . . .	2-40
<b>2.11</b>		<b>SIC CODE 7389 - SOLVENT RECOVERY SERVICES ONLY . . . . .</b>	<b>2-41</b>
	2.11.1	Description of SIC code . . . . .	2-41

2.11.2	Principal Activities	2-41
2.11.3	TRI Chemicals	2-41
2.11.4	Results of the Analysis	2-41
2.11.5	Limitations of the Analysis	2-42
<b>2.12</b>	<b>SUMMARY</b>	<b>2-42</b>
<b>CHAPTER 3:</b>	<b>COST ESTIMATES</b>	<b>3-1</b>
<b>3.1.</b>	<b>INDUSTRY COST ESTIMATES</b>	<b>3-1</b>
3.1.1	Methodology	3-1
3.1.2	Unit Cost Estimates	3-3
3.1.3	Total Industry Costs	3-18
3.1.4	Costs for State-Owned and Locally-Owned Facilities	3-19
3.1.5	Transfer Payments and Non-Monetized Coasts	3-19
<b>3.2</b>	<b>EPA COSTS</b>	<b>3-19</b>
<b>3.3</b>	<b>TOTAL COMPLIANCE COSTS</b>	<b>3-20</b>
<b>3.4</b>	<b>REPORTING COSTS UNDER REGULATORY ALTERNATIVES</b>	<b>3-21</b>
	References	3-47
<b>CHAPTER 4:</b>	<b>ESTIMATED IMPACTS ON SMALL ENTITIES</b>	<b>4-1</b>
<b>4.1</b>	<b>REGULATORY FLEXIBILITY ACT</b>	<b>4-1</b>
<b>4.2</b>	<b>METHODOLOGY</b>	<b>4-1</b>
<b>4.3</b>	<b>GENERATION OF COMPANY REVENUE DATA</b>	<b>4-3</b>
4.3.1	Organization of the Dun & Bradstreet Information	4-3
4.3.2	Classification of Company Business Operations in the Dun & Bradstreet Data Base	4-4
<b>4.4</b>	<b>MATCHING COMPANY REVENUE DATA WITH REPORTING COST DATA</b>	<b>4-5</b>
<b>4.5</b>	<b>RESULTS AND LIMITATIONS</b>	<b>4-6</b>
4.5.1	SIC Code 10 (Metal Mining)	4-8
4.5.2	SIC Code 12 (Coal Mining)	4-8
4.5.3	SIC Code 14 (Non-Metal Mining)	4-9
4.5.4	SIC Codes 40 (Railroad Transportation) and 47 (Transportation Services)	4-9
4.5.5	SIC Code 42 (Motor Freight and Warehousing)	4-10
4.5.6	SIC Code 45 (Air Transportation)	4-10
4.5.7	SIC Code 46 (Pipelines)	4-10
4.5.8	SIC Code 49 (Electric, Sanitary, and Gas Services)	4-11
4.5.9	SIC Codes 50 and 51 (Wholesale Trade)	4-12
4.5.10	SIC Code 7389 (Solvent Recyclers)	4-12
<b>4.6</b>	<b>DETAILED SMALL BUSINESS ANALYSIS SIC CODE 12 (COAL MINES)</b>	<b>4-46</b>
4.6.1	Assumptions and Data Sources	4-46
4.6.2	Revenue, Cost, and Profit Calculations	4-50
4.6.3	Compliance Cost Estimates	4-51
4.6.4	Potential Impacts on Isolated Mines and Co-located Facilities	4-51
4.6.5	Potential Impacts on Isolated Mines Using Isolated Prep Plants	4-65

<b>4.7</b>	<b>DETAILED SMALL BUSINESS ANALYSIS FOR SIC CODE 42 (MOTOR FREIGHT AND WAREHOUSING) AND SIC CODE 50/51 (WHOLESALE TRADE)</b>	4-70
4.7.1	Approach and Limitations for Analysis for SIC 42 - Motor Freight and Warehousing	4-70
4.7.2	Approach and Limitations of Analysis for SIC Codes 50 and 51 - Wholesale Trade	4-71
4.7.3	Measures and Computations of the Analysis	4-71
4.7.4	Analysis of Alternative Reporting Options for Facilities in SIC Code 5169	4-81
<b>4.8</b>	<b>DETAILED SMALL BUSINESS ANALYSIS FOR STEAM- GENERATING POWER PLANTS (SIC CODE 4911)</b>	4-103
<b>4.9</b>	<b>DETAILED ANALYSIS FOR SEWERAGE SYSTEMS (POTWs) (SIC CODE 4952)</b>	4-113
<b>4.10</b>	<b>DETAILED ANALYSIS FOR REFUSE SYSTEMS - LANDFILLS (SIC CODE 4953)</b>	4-117
4.10.1	Estimating Compliance Costs and the Number of Affected Landfills per State	4-117
4.10.2	Cost Impacts on Landfills	4-118
4.10.3	Cost Impacts on Households	4-129
	References	4-134
<b>CHAPTER 5: SENSITIVITY ANALYSIS</b>		5-1
<b>5.1</b>	<b>WAGE RATES</b>	5-1
5.1.1	Salary Data	5-3
5.1.2	Wage Rates	5-5
5.1.3	Results	5-8
<b>5.2</b>	<b>STAFFING VARIATIONS</b>	5-8
<b>5.3</b>	<b>UNIT TIME ESTIMATES</b>	5-10
<b>5.4</b>	<b>VARIATION IN THE NUMBER OF CERTIFICATION STATEMENTS</b>	5-10
<b>5.5</b>	<b>INDUSTRY-SPECIFIC SENSITIVITY ANALYSES</b>	5-19
5.5.1	Metal and Non-Metal Mining - SIC Codes 10 and 14	5-19
5.5.2	Trucking and Warehousing - SIC Code 42	5-20
5.5.3	Electric, Sanitary, and Gas Services - SIC Code 49	5-21
5.5.4	Wholesale Trade - SIC Codes 50 and 51	5-23
<b>5.6</b>	<b>CONCLUSIONS</b>	5-25
	References	5-30
<b>CHAPTER 6: BENEFITS</b>		6-1
<b>6.1</b>	<b>INTRODUCTION</b>	6-1
<b>6.2</b>	<b>ASSESSMENTS OF BENEFITS OF THE TRI INDUSTRY EXPANSION</b>	6-3
6.2.1	Analysis of Air Release Data	6-4
6.2.2	Use of TRI Data	6-23
	References	6-27

<b>CHAPTER 7: ENVIRONMENTAL JUSTICE ANALYSIS OF THE PROPOSED EXPANSION OF TOXIC RELEASE INVENTORY INDUSTRY COVERAGE</b>	<b>7-1</b>
<b>7.1 INTRODUCTION</b>	<b>7-1</b>
<b>7.2 METHODOLOGY</b>	<b>7-3</b>
7.2.1 SIC Code Data Sources	7-3
7.2.2 Geographic Data	7-8
7.2.3 Demographic Data	7-10
7.2.4 Analysis of SIC Code, Geographic and Demographic Data	7-10
<b>7.3 RESULTS</b>	<b>7-13</b>
7.3.1 Analysis of Potential Candidates for Expansion	7-13
7.3.2 Analysis of Likely Candidates for Expansion	7-28
<b>7.4 CONCLUSION</b>	<b>7-32</b>
7.4.1 Potential Candidates for Expansion	7-33
7.4.2 Likely Candidates for Expansion	7-34
References	7-35
 <b>CHAPTER 8: ALTERNATE MEANS OF CONSTRUCTING TOXIC RELEASE DATA</b>	 <b>8-1</b>
<b>8.1 INTRODUCTION</b>	<b>8-1</b>
<b>8.2 POTENTIAL ALTERNATE SOURCES OF TRI RELEASE AND TRANSFER DATA ELEMENTS</b>	<b>8-4</b>
<b>8.3 MEDIA SPECIFIC INFORMATION</b>	<b>8-4</b>
8.3.1 Fugitive/Non-Point Air Emissions and Stack/Point Air Emissions	8-4
8.3.2 Discharges Directly to Surface Water	8-11
8.3.3 Underground Injection and Land Disposal On-Site	8-15
8.3.4 Discharges to a POTW	8-21
8.3.5 Transfers to Other Off-Site Locations	8-21
<b>8.4 REVIEW OF STATE RIGHT-TO-KNOW PROGRAMS</b>	<b>8-22</b>
<b>8.5 POTENTIAL ALTERNATE SOURCES OF TRI INVENTORY DATA</b>	<b>8-25</b>
<b>8.6 POTENTIAL ALTERNATE SOURCES OF POLLUTION PREVENTION AND EMERGENCY RELEASE DATA</b>	<b>8-28</b>
8.6.1 EPA Data Bases with Pollution Prevention Data	8-28
8.6.2 State Environmental Agency Data Bases	8-30
8.6.3 Alternative Sources of Emergency Release Data	8-31
8.6.4 Conclusion: Pollution Prevention and Accidental Release Data	8-34
<b>8.7 VALUE ADDED FROM THE TRI REPORTING SYSTEM</b>	<b>8-35</b>
References	8-38

#### **APPENDIX A: COMPOSITION OF CRUDE OIL AND PETROLEUM PRODUCTS**

#### **APPENDIX B: TRI FORM R AND ALTERNATE THRESHOLD CERTIFICATION STATEMENT**

#### **APPENDIX C: SIC CODE 10 - METAL MINING**

#### **APPENDIX D: SIC CODE 12 - COAL MINING**

**APPENDIX E: SIC CODE 14 - NONMETAL MINING**

**APPENDIX F: SIC CODES 40 AND 47 - RAILROADS AND TRANSPORTATION SERVICES**

**APPENDIX G: SIC CODE 42 - TRUCKING AND WAREHOUSING**

**APPENDIX H: SIC CODE 45 - AIR TRANSPORTATION**

**APPENDIX I: SIC CODE 46 - PIPELINES**

**APPENDIX J: SIC CODE 49 - ELECTRIC, GAS, AND SANITARY SERVICES**

**APPENDIX K: SIC CODES 50 AND 51 - WHOLESALE TRADE**

**APPENDIX L: SIC CODE 7389 - SOLVENT RECOVERY SERVICES ONLY**

**APPENDIX M: EPA EMPLOYEE AND COST MODEL FOR TRI**

**APPENDIX N: QUALIFYING TO USE THE ALTERNATE THRESHOLD**

**APPENDIX O: DATA BASE ANALYSIS**

**APPENDIX P: LIST OF TRI CHEMICALS**

**APPENDIX Q.1: TRI CHEMICALS REPORTED TO NON-TRI DATA BASES**

**APPENDIX Q.2: CALIFORNIA AIR EMISSIONS REPORTING**

**APPENDIX Q.3: CHEMICALS COVERED IN THE GREAT LAKES REGIONAL AIR TOXICS EMISSION INVENTORY**

**APPENDIX Q.4: PUBLIC ACCESS TO EPA DATA BASES**

**APPENDIX R: TRI INDUSTRY EXPANSION - ASSOCIATED REQUIREMENTS**

## Executive Summary

EPA is evaluating the potential to expand reporting requirements under Section 313 of the Emergency Planning and Community Right to Know Act (EPCRA) to include certain non-manufacturing industries. Information reported by these industries would then be included on the Toxic Release Inventory (TRI), the database that contains release and transfer data reported by EPCRA Section 313 listed industries.

EPA considered expanding coverage of TRI to twelve additional SIC codes (or parts thereof). They are SIC code 10 - Metal Mining, SIC code 12 - Coal Mining, SIC code 14 - Nonmetal Mining, SIC code 40/47 - Railroad Transportation and Transportation Services, SIC code 42 - Motor Freight Transportation and Warehousing, SIC code 45 - Air Transportation, SIC code 46 - Pipelines, Except Natural Gas, SIC code 49 - Electric, Sanitary, and Gas Services, SIC code 50/51 Wholesale Trade, and SIC code 7389- Solvent Recovery Services. Regulatory alternatives were created by varying the scope of the expansion (i.e., choosing alternative groups of industry sectors) and modifying selected structural elements of the program.

For the regulatory options considered, the estimated number of facilities reporting ranges from 6,393 to 52,378. The estimated number of reports across all options ranges from 249,063 to 31,020. Estimated industry costs across all options range from \$148 million to \$1.4 billion for the first year. Subsequent year costs range from \$97 million for to \$794 million for the various regulatory alternatives.

The proposed option is estimated to result in 37,580 reports from 6,424 facilities. Industry costs for the proposed option are estimated to be \$190 million for the first year and \$118 million in subsequent years. Costs to EPA of the proposed option are estimated to add an additional \$2.7 million. A summary of the reporting burden and industry costs for the proposed option by industry can be found in Table ES-1.

**TABLE ES-1**  
**SUMMARY OF REPORTING FOR PROPOSED INDUSTRIES**

Industry	Number of Facilities in Industry	Number of Reporting Facilities	Number of Reports	Estimated Costs (\$ million per year)	
				First Year	Subsequent Years
Metal Mining	1,060	328	1,176	\$6.5	\$3.8
Coal Mining	3,213	321	642	\$5.4	\$2.5
Electric Utilities	3,139	974	5,567	\$26.6	\$16.6
Hazardous Waste Treatment & Disposal Facilities	164	164	6,711	\$31.2	\$21.5
Chemicals & Allied Products - Wholesale	9,014	782	11,139	\$51.5	\$33.5
Petroleum Bulk Stations & Terminals - Wholesale	10,292	3,842	12,394	\$69.3	\$40.7
Solvent Recovery Services	40	17	85	\$4	\$3
<b>Total</b>	<b>28,021</b>	<b>6,428</b>	<b>37,714</b>	<b>\$191</b>	<b>\$118.8</b>

TRI is a unique database that enables all interested parties to establish credible baselines, to set realistic goals for environmental progress over time, and to measure progress in meeting these goals over time. While there are other data sources that provide similar information at both the State and Federal level, these do not provide precisely the same information found in TRI or in the publicly accessible format of TRI.

Two types of benefits are associated with TRI. The first type of benefit is the pure value of information on releases, transfers, and other waste management practices. It is expected that the proposed rule will generate benefits by providing the public with access to information that otherwise would not be available to them. This is a correction to a market failure. Benefits result from improvements in understanding, awareness and decision-making related to the provision of information.

The second type of benefits derives from changes in behavior that result from the information reported to TRI. These changes, including reductions in the releases and changes in the waste management practices for toxic chemicals, yield health and environmental benefits. These activities may ultimately derive from TRI reporting, but are not required by the proposed industry expansion rule. These changes in behavior address the negative externality associated with the release of toxic chemicals.

EPA examined the impacts of expanding the industry coverage of TRI on small business and environmental justice in minority and low-income populations and assessed the implications for unfunded mandates. After performing screening analysis, and where appropriate, detailed analyses, potentially significant impacts were found in connection with reporting burdens for only one group being proposed for addition to EPCRA section 313, the chemicals wholesaling industry (SIC code 5169 - Chemicals & Allied products). There are sufficient uncertainties regarding the impacts on another industry, RCRA subtitle C hazardous waste facilities in SIC code 4953 that EPA cannot confidently make a determination at this time regarding the magnitude and incidence of the impacts.

EPA's analysis found that households with annual incomes less than \$15,000 and minority and urban populations are over-represented in zip codes containing facilities in the proposed industries. Furthermore, the TRI expansion would result in persons in approximately 2,000 zip codes receiving TRI information about facilities in their community for the first time. In these zip codes, low income households, minorities, and rural dwellers exceed the national average.

It is estimated that 244 public facilities will be affected by the proposed option at a total cost in the first year of \$8.4 million and \$5.4 million in subsequent years. Private expenditures will exceed \$100 million in all years.

## Summary

### S.1 INTRODUCTION

Under Section 313 of the Emergency Planning and Community Right to Know Act (EPCRA), also known as Title III of the Superfund Amendments and Reauthorization Act of 1986, certain facilities are required to file annual reports to the United States Environmental Protection Agency (EPA) and States on their release(s) and transfer(s) of certain toxic chemicals if they exceed specific thresholds. The statute applied the requirements of EPCRA Section 313 only to manufacturing industries, but gave EPA the authority to modify the list of industries subject to reporting. EPA is now evaluating the potential to expand reporting requirements to include certain non-manufacturing industries. These industries would then be required to report certain chemical releases and transfers to EPA. This information would then be included on the Toxic Release Inventory (TRI), the database that contains release and transfer data reported by EPCRA Section 313 listed industries. This analysis reviews the impacts of the regulatory options considered for expanding the industry coverage of EPCRA Section 313.

### S.2 NEED FOR INFORMATION

#### S.2.1 MARKET FAILURE

Markets will fail to achieve socially efficient outcomes when differences exist between market and social values. Failure of the market to provide complete information often allows for such divergences. With insufficient information, individuals' choices regarding where to live, work, etc. may not optimize their well-being. In another type of market failure, one party's actions may impose uncompensated costs or benefits on another party outside the marketplace. For example, a facility releasing toxic chemicals to the environment may impose environmental and health risks on adjacent communities. This is known as a negative externality. Where this exists, it is the community (or some other party), not the facility, that bears the costs of these actions.

TRI reporting is designed to correct the failure of the market to provide complete information by informing the public about the release of toxic chemicals. This allows informed decisions to be made by society, consumers, workers, and others that allows for efficient decisions that optimize well-being. By its actions, an informed public may also address the negative externality resulting from socially inefficient levels of toxic releases and transfers. TRI provides vital information for the efficient design and targeting of Federal, State, and local programs, for consumers to make purchasing decisions, and for lenders and investors to make business decisions. The effect of these activities can be to lead industry to internalize, to some degree, the social costs of toxic releases and transfers. Additionally, TRI can assist facilities in judging their own performance and prioritizing areas for pollution prevention and/or treatment. In this manner, society is moved toward a more efficient allocation of resources.

#### S.2.2 CURRENT SOURCES OF RELATED INFORMATION

The TRI contains information on releases, transfers, inventories and pollution prevention activities for over 650 toxic chemicals and chemical categories from certain facilities identified by SIC codes 20-39. Currently, there are several other data sources that provide similar information at both the Federal and State levels. Several contain media specific data on releases and transfers. However, these databases do not provide precisely the same information found in TRI and none are designed to facilitate public access and use,

as is TRI. In addition, differences across databases in data collected, in data coverage and in reporting frequencies, and difficulties in integrating data from the various sources to provide information at a facility level, make it unlikely that these sources could substitute for TRI. Also, some of the sources rely on voluntary reporting, which may decrease the amount of information available.

Several of the major data sources and the ease with which they might substitute for TRI are listed in Table S-1. In many cases, data within these sources is likely to include SIC codes currently covered and proposed to be covered by TRI. However, the data collected are subject to different requirements, are collected for different purposes and are not structured so as to allow chemical specific multi-media comparisons. TRI also collects pollution prevention information that may not be available from these sources. Finally, the multiple sources identified have differing definitions and areas of coverage further confounding any effort to duplicate that which is found in a readily accessible manner in TRI.

**TABLE S-1  
MAJOR RELEASE AND TRANSFER DATABASES**

<b>Data Source</b>	<b>Media and Chemical Coverage</b>	<b>Relevant Releases Statistics Available</b>	<b>Ease of Database Substitution for TRI Data<sup>1</sup></b>
Aerometric Information Retrieval System (AIRS), Facility Subsystem (AFS)	Contains annual emissions of six criteria air pollutants for facilities above reporting thresholds. Also contains limited information on toxics.	Total annual releases; average daily releases in non-attainment areas.	Limited toxics data due to submission being voluntary by states.
Permit Compliance System (PCS)	Contains monthly discharge monitoring data and flow rates for major sources of water pollutants.	Contains concentration data; total annual releases can be calculated; average daily releases, maximum "moment" if continuous monitoring.	Only includes chemicals for which a discharge limit has been set. Difficult to link between PCS parameters and CAS #; very limited monitoring data for minor dischargers.
Biennial Reporting System (BRS)	Contains waste volumes by RCRA waste code reported biennially.	Total annual off-site transfers of hazardous waste for land disposal; total annual releases to POTW without treatment.	Many RCRA waste codes are not specific to an individual CAS #. Quantities of chemicals in waste can not be determined. Portion of waste stream matching each waste code can not be determined.

<sup>1</sup>"Ease of Substitution" refers only to the potential of the information in the database to substitute for TRI reporting. It does not imply that the database is not adequate for the purposes for which it was designed.

## **S2.3 CONCLUSION**

TRI is a unique database and can not be duplicated with other existing data sources. The database has been successful in providing public information since collection started in 1987, however, information gaps still exist. The proposed rule to expand the number and type of reporting facilities is intended to build upon the past success of the TRI program and to address some of those gaps.

## **S.3 INDUSTRIES CONSIDERED FOR THE EXPANSION**

EPA considered expanding coverage of TRI to twelve additional SIC codes (or parts thereof). Each industry group was evaluated to determine if it included activities or facilities that were likely to involve the manufacture, process, or otherwise use of chemicals listed on TRI. Table S-2 provides a listing of those SIC codes that were under consideration as well as a description of the activities and associated chemicals that would likely trigger TRI reporting for those industries.

## **S.4 REGULATORY ALTERNATIVES**

Several regulatory alternatives were considered in this analysis. They were created by varying the industries covered by the regulation and modifying selected structural elements of the program (i.e., revising the guidance for otherwise use, changing the de minimis exemption for certain industries under consideration, etc.).

EPA considered three options for industry coverage in its regulatory alternatives. The first, a comprehensive option, covers 11 industries at the two digit level SIC code and a twelfth industry group which is part of a four digit SIC code. A limited industry coverage option includes a mix of two and four digit SIC codes with some select portions of four digit SIC codes. The scope of the final option for industry coverage, the modified limited industry coverage option, includes a mix of two and four digit SIC codes. These options for industry coverage are further combined with modifications to the guidance on otherwise use and changes in the de minimis exemption for certain industries to form the nine distinct regulatory alternatives analyzed. The regulatory alternatives and their basic features are described in Table S-3. The proposed alternative, alternative III.B., is shaded.

### **S4.1 CURRENT AND REVISED GUIDANCE ON OTHERWISE USE**

The interpretation of otherwise use is the primary differentiating factor between many of the options (e.g., I.A and I.B). The current regulatory definition of otherwise use encompasses any activity involving a listed chemical that does not fall under the definitions of "manufacture" or "process". A chemical that is otherwise used by a facility is not incorporated into a product for distribution in commerce. For example, lubricants, cooling fluids, cleaners, and catalysts are typically otherwise used by facilities that consume them. Under the current guidance, the amount of a chemical treated or disposed is not used in calculating reporting thresholds for otherwise use. The current guidance is applicable to alternatives I.A, II.A, III.A, IV.A, IV. B, and V.

The revised guidance for otherwise use would extend the current guidance to include stabilization (or solidification), treatment for destruction, and disposal when the facility engaged in these activities receives materials containing any chemical from one or more other facilities for the purposes of further waste

management activities. It is applicable to Alternatives I.B, II.B, and III.B.

#### **S4.2 EXCLUSIONS AND LIMITATIONS**

Two alternatives, IV.A and IV.B are based upon industry coverage of the comprehensive industry coverage option (alternative I), but they differ in their treatment of the mining industry group. Alternative IV.A limits reporting of chemicals processed in the industry group to only the primary product of the facility (e.g., copper at a copper mine, lead at a lead mine). Alternative IV.B is also based upon the comprehensive industry coverage option (alternative I), however, offers an expanded treatment of the mining industry group. Under this option, the de minimis limitation does not apply for chemicals being extracted or mined.

The final alternative, alternative V, is also based upon the comprehensive industry coverage option (alternative I). This alternative, however, expands the coverage on the electric utility industry by excluding the de minimis limitation for fuels at these facilities.

#### **S.5 ESTIMATED REPORTING ACTIVITY**

For each of the industries considered for addition to TRI, EPA estimated the number of affected facilities and the number of reports anticipated under each regulatory option. Facilities were judged to be required to report if 10 or more employees work at the facility and evidence indicated that TRI chemicals were manufactured, processed, or otherwise used in amounts that would require reporting under the various regulatory options.

Table S-4 illustrates the estimated number of facilities in each industry group under consideration, the number of facilities estimated to report, and the number of reports under each regulatory option. The proposed alternative is highlighted.

The estimated number of facilities reporting ranges from a high of 52,378 for option I.B to 6,397 for alternative III.A. The estimated number of reports ranges from 249,063 for alternative I.B to 31,1540 for alternative III.A. The proposed option, alternative III.B, is estimated to result in 37,714 reports from 6,428 facilities.

#### **S.6 COSTS**

The costs that the industry and EPA will incur as a result of the industry expansion were estimated for each of the regulatory options considered. Industry costs were evaluated using a straightforward methodology that requires identifying the tasks that facilities would have to perform as a result of the industry expansion rule, determining the unit costs of each activity, estimating the number of facilities that would perform each task, and multiplying the labor cost by the number of relevant facilities.

**TABLE S-2**  
**INDUSTRIES CONSIDERED FOR EXPANSION**

Industry Group	Chemicals and Activities Likely to Trigger Reporting
10 - Metal Mining	Constituents of extracted ore (e.g., lead, copper, silver, cobalt, etc.); Chemicals used in processing ore (e.g., sodium cyanide)
12 - Coal Mining	Chemicals used in coal processing (ethylene glycol, tetrachloroethylene, dichlorodifluoromethane, 1,1,1-trichloroethane, xylene, phenanthrene, etc.)
14 - Nonmetal Mining	Flotation reagents, carbonation and leaching agents, and chemicals used in heavy media separation (Chromic acid, ammonium nitrate, hydrochloric acid, methanol, propylene, sulfuric acid, phosphoric acid, 1,1,1-trichloroethane, zinc, zinc ferrite, phosphorous, hydrogen sulfide, etc.)
40/47 - Railroad Transportation and Transportation Services	Solvents in painting operations (e.g., methyl ethyl ketone, toluene, xylene, ethyl benzene) Components of railcars (e.g., manganese) Refrigerants (e.g., freon) Fuel components (e.g., phenanthrene (diesel fuels), hydrazine, nitric acid (rocket fuels))
42 - Motor Freight Transportation and Warehousing	Gasoline fueling (methyl tert-butyl ether (MTBE), benzene, ethyl benzene, toluene, xylene, n-hexane, and cyclohexane); Diesel fueling (phenanthrene); Use of maintenance fluids (ethylene glycol); Solvents used in truck cleaning operations (methyl ethyl ketone, methyl isobutyl ketone, xylene); Waste streams for transportation equipment cleaning operations (Possibly any TRI chemicals)
45 - Air Transportation	De/anti-icing of aircraft and ground surfaces (e.g., ethylene and propylene glycols); Maintenance, repair, and cleaning of aircraft (dichloromethane, methyl ethyl ketone, sulfuric acid, toluene, 1,1,1-trichloroethane, trichloroethane)
46 - Pipelines, Except Natural Gas	None.
49 - Electric, Sanitary, and Gas Services	Manufactured emissions from utilities and combination utilities (sulfuric acid, hydrochloric acid, hydrofluoric acid, formaldehyde, chromium, manganese, and nickel); Fuel use at utilities and combination utilities (various TRI constituents in coal and oil) Use of cleaning agents and other chemicals at utilities and combination utilities (e.g., bromine, chlorine, ethylene glycol, formic acid, hydrazine, and thiourea); Chemicals that are treated for destruction, solidified or stabilized, or disposed (nearly any listed section 313 chemical); Chemicals used for treatment, maintenance, etc (chlorine, hydrochloric acid, sulfuric acid, etc)
50/51 Wholesale Trade	Cutting metal or wire (copper, zinc, nickel, and tetrachloroethylene); Dismantling of automobiles for scrap (lead and ethylene glycol); Chemicals used to produce plastic materials and shapes (methanol, methylene chloride, xylene, methyl methacrylate, cyclohexane, methyl ethyl ketone, toluene, maleic anhydride, formaldehyde, diethanolamine, styrene, trichloroethylene, n-butyl alcohol, ethylene glycol, isopropyl alcohol, methyl isobutyl ketone, methyl tert-butyl ether); Chemicals that are repackaged or processed (nearly any listed section 313 chemical); Distribution of petroleum products from bulk terminals and bulk plants (benzene, MTBE, xylene, toluene, n-hexane, ethyl benzene, phenanthrene, benzo(a)anthracene, etc.); Repackaging of agricultural chemicals (ammonia and pesticides); Repackaging of paints and varnishes (isopropyl alcohol, methyl ethyl ketone, toluene, methyl isobutyl, ketone, and xylene)
7389 Solvent Recovery Services	Solvents such as carbon tetrachloride, chloroform, chlorofluorocarbons, methanol, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, perchloroethylene, toluene, 1,1,1-trichloroethane, trichloroethylene, xylene and n-methyl-2-pyrrolidone)

**TABLE S-3**  
**REGULATORY ALTERNATIVES CONSIDERED**

<b>Regulatory Alternative and Industry Coverage</b>	<b>Industries or Activities</b>	<b>Otherwise Use</b>
I.A Comprehensive Industry Coverage	SICs 10, 12, 14, 40, 42, 45, 46, 47, 49, 50, 51 and part of 7389(Solvent Recovery Services)	Current guidance
I.B Comprehensive Industry Coverage	Same industries as Regulatory Alternative I.A	Revised guidance
II.A Limited Industry Coverage	SICs 10,12, 4911, 4931, 4939, part of 4953 (RCRA subtitle C treatment and disposal facilities), 5169, 5171, and part of 7389 ( Solvent Recovery Services))	Current guidance
II.B Limited Industry Coverage	Same industries as Regulatory Alternative II.A	Revised guidance
III.A Modified Limited Industry Coverage - Proposed Industries	SIC 10 (except mining services), 12 (except extraction and mining services), parts of 4911, 4931, and 4939 (coal and oil fired electric utilities), part of 4953 (RCRA subtitle C treatment and disposal facilities), 5169, 5171, and part of 7389 (Solvent Recovery Services)	Current guidance
III.B Modified Limited Industry Coverage - Proposed Industries	Same industries as Regulatory Alternative III A	Revised guidance
IV.A Comprehensive Industry Coverage, Limited Mining Reporting	Same industries as Regulatory Alternative I.A, but limiting reporting of chemicals processed in mining industry to the primary product of the facility.	Current guidance
IV.B Comprehensive Industry Coverage, Expanded Mining Reporting	Same industries as Regulatory Alternative I.A, but without applying de minimis limitation to mining industries.	Current guidance
V. Comprehensive Industry Coverage, Expanded Electric Utility Reporting	Same industries as Regulatory Alternative I.A, but without applying de minimis limitation to fuels used at electric utilities.	Current guidance

**TABLE S-4**  
**NUMBER OF FACILITIES REPORTING AND REPORTS**

Industry Group	Total Number of Facilities	Number of Reporting Facilities; Number of Reports								
		Option I.A.	Option I.B.	Option II.A.	Option II.B.	Option III.A.	Option III.B.	Option IV.A.	Option IV.B.	Option V.
Metal Mining SIC 10		328; 1,176	328; 1,176	328; 1,176	328; 1,176	328; 1,176	328; 1,176	281; 654	328; 2,522	328; 1,176
Coal Mining SIC 12		321; 642	321; 642	321; 642	321; 642	321; 642	321; 642	321; 642	1,749; 9,984	321; 642
Non-Metal Mining SIC 14		427; 508	427; 508	N/A	N/A	N/A	N/A	427; 508	427; 508	427; 508
Railroad Transp. SIC 40		731; 2,112	731; 2,112	N/A	N/A	N/A	N/A	731; 2,112	731; 2,112	731; 2,112
Motor Freight Transp. SIC 42		26,415; 49,544	26,526; 60,585	N/A	N/A	N/A	N/A	26,415; 49,544	26,415; 49,544	26,415; 49,544
Air Transp. SIC 45		824; 984	824; 984	N/A	N/A	N/A	N/A	824; 984	824; 984	824; 984
Pipelines SIC 46		0; 0	0; 0	N/A	N/A	N/A	N/A	0; 0	0; 0	0; 0
Transp. Services SIC 47		155; 440	155; 440	N/A	N/A	N/A	N/A	155; 440	155; 440	155; 440
Electric, Gas, and Sanitary Services SIC 49		10,700; 19,287	13,793; 147,092	3,064; 11,641	3,095; 18,201	1,107; 5,718	3,134; 12,278	10,700; 19,287	10,700; 19,287	10,700; 25,903
Wholesale Trade SIC 50		9,256; 35,439	9,256; 35,439	4,624; 23,533	4,624; 23,533	4,624; 23,533	4,624; 23,533	9,256; 35,439	9,256; 35,439	9,256; 35,439
Solvent Recovery SIC 7389		17; 85	17; 85	17; 85	17; 85	17; 85	17; 85	17; 85	17; 85	17; 85
Total		49,174; 110,217	52,378; 249,063	8,354; 37,077	8,385; 43,637	6,397; 31,154	6,428; 37,714	49,127; 109,695	50,602; 120,905	49,174; 116,833

N/A = not applicable

## **S.6.1 INDUSTRY COSTS**

### **Tasks**

The general tasks that a subject facility may be required to perform as a result of TRI listing may include compliance determination, rule familiarization, calculations and report completions, mailing and record keeping, and activities associated with certification. Several of these costs are expected to decrease after the first reporting year as companies become familiar with the reporting requirements, develop methods for estimating releases, and develop approaches for record keeping and other requirements.

#### **Compliance Determination**

Facilities must determine whether they meet the criteria for Section 313 reporting (i.e., it is within SIC codes covered by the TRI program, it has ten or more employees, and it manufactures, processes, or otherwise uses any of the listed chemicals above the threshold quantities.). The cost estimates assume that incremental costs will not be incurred as a result of the determination of what SIC code the facility is or the number of employees.

Provided that a facility falls within an appropriate SIC code and has ten or more employees, compliance determination costs are expected to result from two additional activities. They are 1) determining what chemicals are manufactured, processed, or otherwise used at a facility and 2) determining whether the chemicals are manufactured, processed, or otherwise used above threshold levels. The second activity involves calculations that would typically involve more effort than the first. Therefore, the time spent making threshold determinations is expected to comprise the majority of the time spent making compliance determinations. Costs from compliance determination will result regardless of whether or not a facility meets the threshold criterion.

#### **Rule Familiarization**

Facilities reporting under Section 313 for the first time must read and become familiar with reporting requirements. At a minimum, this would involve reading the instructions to the TRI reporting Form R, but it may also involve consulting EPA guidance documents, attending a training course and/or calling the EPCRA technical hotline. The cost associated with rule familiarization occurs only in the first year after a facility becomes subject to reporting. In subsequent years, the staff will be familiar with the requirements that apply to their facility, and would no longer bear this cost.

#### **Calculations and Report Completion (Form R)**

Facilities that determine that they must report under Section 313 will incur additional costs to retrieve, process, review, and transcribe information to complete each report. The facility must complete one Form R for each TRI listed chemical it is required to report. Initial year costs are expected to be greater than subsequent year costs, as the latter will consist of verifying and updating data, reviewing previous calculations, and modifying the information reported on the previous year's Form R.

### **Calculations and Report Completion (Certification Statement)**

Facilities with an annual reportable amount of a TRI chemical released and otherwise managed of 500 pounds or less can take advantage of the alternate manufacture, process, or otherwise use threshold of one million pounds. In such a case, the facility would complete a certification statement. In order to file a certification statement, facilities must first determine that they qualify for the alternate threshold for low annual reportable amounts. Therefore, filing an annual certification involves two steps that will incur costs. First, a facility must estimate its annual reportable amount and the amount manufactured, processed, or otherwise used. Second, it must complete the certification statement. A separate certification is required for each TRI chemical for which a facility qualifies for the alternate threshold.

### **Mailing and Record keeping**

Following completion of the appropriate report, additional costs are incurred for mailing and record keeping. Record keeping allows a facility to use information in making calculations in subsequent years, and as documentation in the event it receives a compliance audit. Facilities may maintain records such as estimation methodology, calculations, engineering reports, inventory, incident, and operating logs, and any other supporting materials. Mailing costs include duplication and postage. Costs for mailing and record keeping are expected to differ between facilities completing Form R and Certification statements, in part, because of the pollution prevention record keeping requirements associated with Form R completion.

### **Unit Costs**

Unit cost estimates were developed for each task by estimating the amount of time required from various personnel types to complete the task multiplied by the hourly wage rates for each level of personnel. Loaded wage rates are estimated to be \$77.61, \$58.29, and \$23.65 per hour for managerial, technical, and clerical labor, respectively. Estimates of the unit time and unit costs for each task are presented in Table S-5.

### **Total Industry Costs**

To compute the industry-wide cost of each compliance activity, the unit cost for each task is multiplied by the relevant number (subject to the regulatory alternative) of facilities or reports associated with that task. With this approach, economies of scale for facilities filing multiple reports are not captured. Table S-6 summarizes total costs to each SIC code of each regulatory alternative. The proposed alternative is highlighted.

First year costs for the alternatives range from \$149 million for alternative III.A to \$1.4 billion for alternative I.B. Subsequent year costs range from \$98 million for alternative III.A. to \$794 million for alternative I.B. As expected, the revised guidance for otherwise use adds costs to the alternatives, in particular, by increasing the number of reports, and costs, to facilities in SIC code 49 (Electric, gas, and sanitary services). Changing the coverage of the mining industries (SIC codes 10 and 12) in alternative IV.A does not significantly change the costs to those industries over the coverage in alternative I.A. Eliminating the de minimis limitation (alternative IV.B) for those industries, however, significantly increases the costs to those industries over alternative I.A. Subsequent year costs increase from \$3.8 million (Metal Mining, alternative I.A.) to \$8.2 million (Metal Mining, alternative IV.B.) and from \$2.5 million (Coal Mining, alternative I.A.) to \$32 million (Coal Mining, alternative IV.B.).

The proposed alternative (III.B.) is estimated to result in costs of \$191 million for the first year and \$119 million in subsequent years. The majority of the costs for this alternative are attributable to the facilities in SIC codes 5169 and 5171, however, several of the other alternatives, I.A., I.B., IV.A., IV.B., and V. are estimated to result in significantly higher costs to these industry segments. The costs of the proposed alternatives, while not the lowest of the alternatives, are significantly less than the highest cost alternative (alternative I.B.).

### **Associated Requirements**

There are various state and federal requirements that are triggered when a facility files a report under EPCRA section 313. The associated requirements include state taxes and fees, state pollution prevention planning requirements, and special requirements for certain National Pollutant Discharge Elimination System (NPDES) storm water permits. These requirements are discussed in the economic analysis, but they are not treated as costs of the rule.

Sixteen states have pollution prevention fees and/or planning requirements triggered by the requirement to file a Federal Form R. Therefore, facilities that become subject to TRI reporting as a result of the industry expansion rule may incur additional expenses due to state requirements. State fee schedules are typically contingent upon the quantity of toxic chemicals reported or the number of chemicals (or Form Rs) reported. In some cases, revenues from TRI fees are reinvested in industry via technical assistance programs and grants. Because these costs result from state requirements, they are not attributable to the regulatory alternatives examined in this analysis. In addition, the fee payments do not necessarily equate to social costs. Payments, such as fees and taxes, that do not result in the consumption of a resource (e.g., labor) are transfer payments and do not represent costs to society. Insufficient information was available to classify the fee payments as either social costs or transfer payments. State fees linked to Form R filing are estimated to range from \$1.3 to \$8.3 million under the proposed regulatory alternative.

The National Pollutant Discharge Elimination System (NPDES) program also establishes linked requirements for some facilities reporting TRI chemicals and applying for certain storm water permits. The special requirements of the NPDES storm water permits are based upon the coverage of EPCRA Section 313 at the time the permits are issued. The NPDES requirements do not apply to industries or chemicals that are added to EPCRA Section 313 until the time of permit renewal (which occurs every 5 years), and may not apply in subsequent permits, depending on the Agency's decisions at the time those permits are issued. Therefore, these costs are considered to be associated with the permitting process and are not considered as part of the costs of the proposed regulation.

### **S.6.2. COSTS TO STATE AND LOCALLY OWNED FACILITIES**

State and local governments own coal- and oil-fired electric utility plants that will be affected by the expansion of TRI to SIC codes 4911, 4931, and 4939. The number of state and locally owned facilities expected to be affected by the proposed alternative (III.B) is 244. These facilities are estimated to provide 1813 reports at a cost of \$8.4 million for the first year and \$5.4 million in subsequent years.

**TABLE S-5**  
**UNIT TIME AND COST ESTIMATES FOR ACTIVITIES**  
**PERFORMED BY INDUSTRY GROUP**

ACTIVITY	UNIT TIME ESTIMATES (hours)			UNIT COST* (1995 Dollars)
	Managerial	Technical	Clerical	
FIRST YEAR				
Rule Familiarization <sup>b</sup>	12.0	22.5	0.0	\$2,243
Compliance Determination <sup>b</sup>	4.0	12.0	0.0	\$1,010
Form R Completion <sup>c</sup>	20.9	45.2	2.9	\$4,330
Certification Completion <sup>c</sup>	16.5	27.7	2.2	\$2,947
Record keeping/Mailing (Form R) <sup>c</sup>	0.0	4.0	0.6	\$257
Record keeping/Mailing (Certification) <sup>c</sup>	0.0	2.4	0.6	\$154
SUBSEQUENT YEARS				
Compliance Determination <sup>c</sup>	1.0	3.0	0.0	\$252
Form R Completion <sup>c</sup>	14.3	3.0	0.0	\$2,946
Certification Completion <sup>c</sup>	11.2	18.9	2.0	\$2,946
Record keeping/Mailing (Form R) <sup>c</sup>	0.0	4.0	1.0	\$257
Record keeping/Mailing (Certification) <sup>c</sup>	0.0	2.4	0.6	\$154

\*Based on loaded wage rates of \$77.61, \$58.29, and \$23.65 per hour for managerial, technical, and clerical labor, respectively.

<sup>b</sup>The unit cost for this activity is estimated at the facility level. It is treated as a fixed cost that does not vary with the number of chemicals handled or reported by a facility.

<sup>c</sup>The unit cost for this activity is estimated to vary with the number of reports submitted. The total cost for this activity at a facility is calculated by multiplying the unit cost by the number of reports submitted by each facility.

**TABLE S-6**  
**ESTIMATED TOTAL INDUSTRY COSTS BY ALTERNATIVE (1995 DOLLARS)**

Industry Group	Estimated Total Industry Costs First Year; Subsequent Years (\$ thousands)								
	Alternative								
	IA	IB	IIA	IIB	IIIA	IIIB	IV.A	IV.B	V
Metal Mining SIC 10	\$6,538; \$3,849	\$6,538; \$3,849	\$6,538; \$3,868	\$6,538; \$3,868	\$6,461; \$3,849	\$6,461; \$3,849	\$4,038; \$2,177	\$12,712; \$8,159	\$6,538; \$3,849
Coal Mining SIC 12	\$5,557; \$2,498	\$5,557; \$2,498	\$5,557; \$2,529	\$5,557; \$2,529	\$5,431; \$2,498	\$5,431; \$2,498	\$5,557; \$2,498	\$51,611; \$32,415	\$5,557; \$2,498
Non-Metal Mining SIC 14	\$5,823; \$2,246	\$5,823; \$2,246	N/A	N/A	N/A	N/A	\$5,823; \$2,246	\$5,823; \$2,246	\$5,823; \$2,246
Railroad Transp. SIC 40	\$12,679; \$7,102	\$12,679; \$7,102	N/A	N/A	N/A	N/A	\$12,679; \$7,102	\$12,679; \$7,102	\$12,679; \$7,102
Motor Freight Transp. SIC 42	\$296,660; \$152,426	\$347,554; \$187,873	N/A	N/A	N/A	N/A	\$296,660; \$152,426	\$296,660; \$152,426	\$296,660; \$152,426
Air Transp. SIC 45	\$10,895; \$3,544	\$10,895; \$3,544	N/A	N/A	N/A	N/A	\$10,895; \$3,544	\$10,895; \$3,544	\$10,895; \$3,544
Pipelines SIC 46	\$424; \$0	\$424; \$0	N/A	N/A	N/A	N/A	\$424; \$0	\$424; \$0	\$424; \$0
Transp. Services SIC 47	\$10,274; \$1,482	\$10,274; \$1,482	N/A	N/A	N/A	N/A	\$10,274; \$1,482	\$10,274; \$1,482	\$10,274; \$1,482
Electric, Gas, and Sanitary Services SIC 49	\$122,484; \$61,305	\$715,654; \$471,378	\$50,494; \$35,029	\$80,821; \$56,076	\$23,691; \$17,149	\$57,842; \$38,080	\$122,484; \$61,305	\$122,484; \$61,305	\$150,374; \$80,769
Wholesale Trade SIC 50/51	\$321,643; \$113,870	\$321,643; \$113,870	\$112,679; \$74,139	\$112,679; \$74,139	\$112,679; \$74,139	\$120,887; \$74,139	\$321,643; \$113,870	\$321,643; \$113,870	\$321,643; \$113,870
Solvent Recovery SIC 7389	\$445; \$277	\$445; \$277	\$445; \$277	\$445; \$277	\$445; \$277	\$445; \$277	\$445; \$277	\$445; \$277	\$445; \$277
Total	\$793,423; \$348,598	\$1,437,486; \$794,118	\$175,713; \$115,842	\$206,040; \$136,889	\$148,707; \$97,911	\$191,066; \$118,842	\$790,923; \$346,927	\$845,651; \$382,826	\$821,313; \$368,063

N/A = not applicable

### S.6.3 EPA COSTS

EPA would incur additional costs should additional industries be added to the TRI. These costs include costs for data processing, outreach, and training, information dissemination, policy and petitions, and compliance and enforcement. This requires additional EPA personnel, as well as extramural funds (for example, for contractor employees to perform data processing). The total costs to EPA of the proposed alternative (alternative III.B) are estimated to be \$2.7 million.

### S.7 PROPOSED ALTERNATIVE

EPA is proposing Alternative III.B, the addition of the following industries to EPCRA section 313: Metal mining, excluding mining services; coal mining, excluding mining services and exempting coal extraction activities; coal- and oil-fired electric utilities; commercial hazardous waste treatment, storage and disposal facilities that are regulated under RCRA subtitle C; chemical and allied products - wholesale; petroleum bulk stations and terminals - wholesale; and solvent recovery services. This alternative uses the revised guidance for otherwise use.

Table S.7 presents the results, by industry group, of the analysis for the proposed alternative. EPA estimates that a total of 37,580 reports, including both Form Rs and Alternate Threshold Certificates will be submitted by facilities. The estimated compliance cost of the alternative is \$190.5 million in the first year, and \$118.4 in subsequent years. The total costs to EPA of the proposed alternative are estimated to be \$2.7 million.

**TABLE S-7**  
**SUMMARY OF REPORTING FOR PROPOSED INDUSTRIES**

Industry Group	Number of Facilities in Industry Group	Number of Reporting Facilities	Percent of Facilities in Industry Group Reporting	Number of Reports	Estimated Costs (\$ million per year)	
					First Year	Subsequent Years
Metal Mining	1,060	328	31%	1,176	\$6.5	\$3.8
Coal Mining	3,213	321	10%	642	\$5.4	\$2.5
Electric Utilities	3,139	974	30%	5,567	\$26.6	\$16.6
Hazardous Waste Treatment & Disposal Facilities	164	164	100%	6,711	\$31.2	\$21.5
Chemicals & Allied Products - Wholesale	9,014	782	9%	11,139	\$51.5	\$33.5
Petroleum Bulk Stations & Terminals - Wholesale	10,292	3,842	37%	12,394	\$69.3	\$40.7
Solvent Recovery Services	40	17	43%	85	\$4	\$3
<b>Total</b>	<b>28,021</b>	<b>6,428</b>	<b>23%</b>	<b>37,714</b>	<b>\$191.1</b>	<b>\$118.8</b>

## S.8 BENEFITS

As stated earlier, TRI contains information on releases, transfers, inventories, and pollution prevention activities for over 650 toxic chemicals and chemical categories from certain facilities identified by SIC codes 20-39. While there are several other data sources that provide similar information at both the Federal and State levels, these databases do not provide comparable information to TRI, and none are designed to facilitate public access and use. Differences in data coverage and reporting frequencies, and difficulty in integrating data from the various sources to provide information at a facility level, make it unlikely that these sources could substitute for TRI.

As a unique database, TRI enables all interested parties to establish credible baselines, to set realistic goals for environmental progress over time, and to measure progress in meeting these goals over time. The information reported to TRI increases knowledge of the levels of pollutants released to the environment and the pathways of exposure, improving scientific understanding of the health and environmental risks of toxic chemicals; allows the public to make informed decisions on where to work and live; enhances the ability of corporate leaders and purchasers to more accurately gauge a facility's potential environmental liabilities; and assists federal, state, and local authorities in making better decisions on acceptable levels of toxics in communities. It serves as a neutral yardstick by which progress can be measured by all. The proposed rule to expand the number and type of reporting facilities is intended to build upon the past success of the TRI program and to similarly build upon benefits.

Two types of benefits are associated with TRI. The first type of benefit is the pure value of information on releases, transfers, and other waste management practices. It is expected that the proposed rule will generate benefits by providing the public with access to information that otherwise would not be available to them. This, in essence, is a correction to a market failure, as discussed earlier in this summary. The benefits result from improvements in understanding, awareness and decision-making related to the provision and distribution of information.

The second type of benefits derives from changes in behavior that result from the information reported to TRI. These changes, including reductions in the releases and changes in the waste management practices for toxic chemicals, yield health and environmental benefits. These activities may ultimately derive from TRI reporting, but are not required by the proposed industry expansion rule. These changes in behavior address the negative externality associated with the release of toxic chemical (also discussed earlier in the summary) and result in costs to industry. The net benefit of such activities are the difference between the benefits of decreased chemical releases and transfers and the costs of the actions needed to achieve them.

Because the current state of the knowledge about the economics of information is not highly developed, this analysis does not attempt to assign monetary value to the pure information benefits of the rule. Because of the inherent uncertainty in the chain of events, the analysis has also not attempted to predict the changes in behavior that result from information, or the resultant benefits and costs. EPA does not believe that current methodologies support the assignment of specific monetary values to the benefits in this particular case.

As an alternative, EPA assessed the potential for the proposed rule to generate benefits comparable to those generated by the currently reporting industries by seeking data on certain characteristics of releases

and transfers, specifically air release data, that could be compared among the various sectors currently subject to or proposed for addition to TRI.

EPA made this assessment using information in the Aerometric Information Retrieval System (AIRS), which is collected under the authority of the Clean Air Act. This analysis compared releases to air from manufacturing facilities (current TRI reporters) to facilities proposed for addition to TRI, for over 100 TRI chemicals. Toxic emissions were estimated via speciation, an approach common to many previous air emissions studies. Results suggest that releases from the proposed industries are expected to be distributed across the range of releases from current industries and that the proposed industries are relatively similar to current TRI industries with respect to release quantities. While limitations in the data set and methodology did not permit estimates of potential TRI releases to be developed, the analysis clearly indicated that substantial volumes of TRI chemical releases will be captured by expanding the TRI system to include the additional industry groups being proposed. EPA believes this evidence lends support to its contention that facilities proposed for addition are likely to generate useful information as part of the TRI program. Further support for this point is that EPA's analysis of the environmental justice impact of the proposed rule suggests that persons residing in over 2000 zip codes may receive TRI data on facilities in their community for the first time. In these zip codes, low income households, minorities, and rural dwellers exceed the national average.

Evidence from current Form R reporting suggests that information available from TRI can lead to voluntary initiatives by industry to review processes, set goals for reductions in emissions, and institute "good neighbor" policies. If an individual facility perceives that the benefits outweigh its costs, then it will implement changes to reduce its use and/or releases of Section 313 chemicals. This leads the EPA to conclude that the additional information provided to government and the public as a result of the industry expansion of TRI may stimulate activities that in turn may impact the behavior of TRI facilities.

Anecdotal evidence in support of this conclusion can be seen in "The Toxic Release Inventory: An Evaluation of Use and Impact", a national study of TRI data users during 1991. This study provides evidence that the availability of TRI data has contributed to the ability of the public to effect changes in behavior in three broad categories of activities. The study found that significant portions of both citizen groups and industry representatives who responded to the survey reported that 1) legislation or regulatory action was stimulated by efforts to use TRI data; 2) source reduction activities had actually taken place; and 3) the data's availability had prompted increased face-to-face meetings between community groups and industry.

Another source, a 1991 General Accounting Office report, "Toxic Chemicals: EPA's Toxic Release Inventory is useful but Can be Improved" concluded that "use of the inventory is extensive", finding that significant numbers of state agencies, are using the TRI database to support a range of activities, including regulation and enforcement, screening of potential health and/or environmental risks, and pollution prevention activities. This is in addition to the EPA's own use of the database. The report likewise showed a substantial response in seeking out environmental management opportunities presented by using the TRI database including improved inventory controls, use of alternative chemicals, improved chemical use controls, and reported improvement in equipment efficiency and/or changes in manufacturing processes.

While this information lends support to the benefits of TRI, there remains uncertainty regarding the ultimate impact of the TRI database on real risk reduction. However, despite incomplete knowledge of the extent to which TRI generated activities may impact societal levels of risk from toxic emissions, the evidence

summarized here serves as both an indicator of the information that the public will gain and of the influence that the program may have in stimulating response mechanisms to effect pollution prevention and rational approaches to reduce emissions and risks.

## S.9 OTHER IMPACTS

The EPA examined the impacts of expanding the industry coverage of TRI on small business and environmental justice in minority and low-income populations and assessed the implications for unfunded mandates.

### S.9.1 SMALL BUSINESS

The Regulatory Flexibility Act (RFA) requires Federal agencies to determine whether their actions will have a significant impact on a substantial number of small entities, including businesses, nonprofit agencies, and governmental jurisdictions. EPA has prepared an initial Regulatory Flexibility Analysis (IRFA) as part of its economic analysis of the proposed rule.

Consistent with the original regulatory impact analysis (RIA) for Section 313, EPA used a definition of 10-49 employees as representative of a small entity instead of using the Small Business Administrations' (SBA's) definition of 500 employees or less. Under the RFA, agencies have been authorized to develop and apply alternative definitions as small business where appropriate and, after providing the public with notice of an opportunity to comment on the alternative, in consultation with the SBA. Nonetheless, the analysis also includes alternative definitions of small entities, consistent with the definition used by the SBA.

Economic impacts were calculated assuming that all TRI reports are Form Rs (and not Toxic Release Inventory Certification Statements), which yields a conservative estimate of costs (i.e., it is likely to overestimate the true impacts). Impacts were calculated for both the first year of reporting and for subsequent years.

The Agency estimates that of the 5,600 facilities potentially affected by the proposed rule, no more than 72 percent are small entities. Thus, approximately 4,600 of the 6,400 facilities potentially affected may need to file at least one report. However, approximately 15,000 small entities in the industry groups being proposed would not have to file a report because they are expected to have less than 10 full-time employees, and thus would be exempt from the requirement to file a report. The overwhelming majority of these entities are small businesses as defined above (10 to 49 employees). A small number of small entities are utilities owned by small governmental jurisdictions. For purposes of this analysis, EPA considered small entities by industry sector, including governmentally-owned utilities together with private utilities.

To assess the potential impacts on small entities of expanding the TRI program to additional industry groups, a preliminary screening analysis was conducted. The screening analysis used compliance costs as a percentage of annual company sales to measure potential impacts. This methodology was based on the premise that the cost impact percentage is a good measure of a firm's ability to afford the costs attributable to a regulatory change. For purposes of screening small entity impacts, comparing sales levels, or revenues, to compliance costs provides a reasonable first-order indication of the magnitude of the

regulatory burden relative to a commonly available measure of a company's business volume. Where regulatory costs represent a very small fraction of a typical firm's revenue (for example, less than 1 percent), the financial impacts of the regulation are expected to be minimal. EPA is currently in the process of considering how to define the RFA statutory terms "significant impact" and "substantial number". Until EPA determines how best to define those terms, the Agency has decided, for this proposed rule, to prepare an IRFA if compliance costs for a substantial number of small entities would be greater than 1 percent of sales.

More extensive, or "detailed," analyses of certain SIC codes were conducted when the screening analysis indicated that the proposed option would cross the analytical threshold stated above for potentially affected industry groups. The methodology followed for each respective detailed analysis was tailored to reflect the unique characteristics of each industry group examined. The potential for significant impacts was found in connection with reporting burdens for the chemical wholesaling industry (SIC code 5169).

Based on the screening analysis, EPA also believes that TRI reporting could potentially impose a significant burden on some small facilities in SIC 4953. However, EPA is not highly confident of the accuracy of the estimated number of reports per facility under the revised guidance for otherwise use, and believes that the current figure is an overestimate. Consequently, the actual number of chemical reports submitted by facilities in SIC code 4953 and the costs to prepare and submit them may be considerably lower than estimated by the screening analysis. Recognizing this uncertainty, EPA has not yet conducted analysis of alternative regulatory and non-regulatory mechanisms for achieving the goals of EPCRA Section 313 for this particular industry group.

#### **Alternatives to Reduce Impacts on Small Businesses**

The EPA considered six alternatives to reduce the impact on small businesses within SIC code 5169. These alternatives are described below.

**Alternative 1:** Expand eligibility for the alternate threshold for facilities in SIC code 5169 by increasing the annual reportable amount for amounts released and managed from 500 pounds and raising the alternate manufacture, process and otherwise use threshold from 1 million pounds. Some small facilities in SIC code 5169 with large numbers of reports may still incur significant impacts to determine their eligibility for the alternate threshold. In addition, EPCRA section 313(f)(2) requires that any revision to the current reporting thresholds continue to capture a substantial majority of total releases of each listed chemical or chemical category. Because these facilities have not reported under TRI in the past, the Agency may not have sufficient information about releases (both types of chemicals and release levels) with which to justify expanding the alternate threshold eligibility for this industry group. Further, because of the type of information submitted on the Alternate Threshold Certification Statement, the resulting data would be of more limited utility than the data that would otherwise be reported on Form R.

**Alternative 2:** Under this alternative, facilities would be allowed an additional year before they had to begin reporting. EPA would use this time to perform intensive outreach, training and technical assistance to industry. This alternative would result in the loss of one year's worth of data, in return for a relatively modest reduction in reporting burden.

**Alternative 3:** Require facilities to report only on air releases and off-site transfers. State data indicate that these two routes account for nearly all of the releases and transfers from facilities in SIC code 5169.

Adopting this alternative would mean forfeiting some information reported pursuant to EPCRA section 313 and all additional information reported pursuant to the Pollution prevention Act of 1990 (PPA) section 6607. This option, therefore, appears to be inconsistent with the existing authorities and requirements under EPCRA section 313 and PPA section 6607. Further, to the extent that facilities in this industry group actually report only air releases and off-site transfers under the current requirements, EPA has overestimated both compliance costs and small business impacts in the standard analysis.

**Alternative 4:** Expand the range reporting alternative beyond the current 1,000 pound limit. The analysis looks at the impact of a 2,000, 5,000 and 10,000 pound limit. Adopting this alternative would reduce the precision of the data in return for a relatively modest reduction in reporting burden.

**Alternative 5:** Require reporting of throughput, and perhaps some information in check-boxes on the types of processes and/or equipment being used. EPA would then combine this information with emission factors to develop release and transfer estimates. This alternative would reduce the reporting burden, because facilities in this industry group are presumed to track their throughput and could readily identify the processes and types of equipment used. However, the resulting release data would be of reduced utility to the public, because they would be based on average emission factors and would not be specific to an individual facility. Finally, this option appears to be inconsistent with the existing authorities and requirements under EPCRA section 313 and PPA section 6607.

**Alternative 6:** A straight exemption of small businesses in the industry group. The overwhelming majority of businesses in this industry group are small and it is anticipated that a significant portion of reported releases would be from small businesses. Adopting this alternative could lead to substantial gaps in information, especially at the community level. Furthermore, only those small firms submitting a large number of reports would substantially reduce the amount of information available without targeting the relief to those particular facilities facing high impacts. By contrast, this alternative would substantially reduce the amount of information available without targeting the relief to those particular facilities facing high impacts (i.e., those submitting a large number of reports).

## S.9.2 ENVIRONMENTAL JUSTICE

Under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, agencies are required to consider the effect of policies and programs that significantly affect human health or the environment on environmental justice. To assess the implications of the industry expansion on environmental justice, the demographic characteristics for populations residing in jurisdictions (county or zip code) where candidate facilities (i.e., new TRI reporters) would be located were examined to determine whether new reporters were disproportionately located near certain subpopulations in the U.S.

The analysis compared the percentage of various subpopulations (low income, minority, etc.) in zip codes containing facilities in the proposed industries with the percentage of each subpopulation represented in the general population. Households with annual incomes less than \$15,000 are slightly over-represented across all zip code groupings containing new reporters. Minority and urban populations are over-represented in zip codes containing facilities in the proposed industries. Groups that are over represented are expected to benefit disproportionately from the TRI expansion in the sense that they will now have greater access to new

chemical emissions data.

Furthermore, the TRI expansion would result in persons in approximately 2,000 zip codes receiving TRI information about facilities in their community for the first time. The concentrations of low-income, minority and rural populations in these 2,000 new zip codes exceed the national average. By adding the proposed industries, EPA will be creating informational benefits for certain subpopulations (low income households, minorities and rural dwellers) that previously did not receive TRI information on releases and transfers of toxic chemicals in their communities.

### **S.9.3 UNFUNDED MANDATES**

Pursuant to Title II of the unfunded Mandates Reform Act of 1995 (UMRA), EPA must estimate the costs to State, local, and tribal governments, in addition to private sector costs. Under the proposed alternative, State, local, and tribal governmentally owned facilities in SIC codes 4910 Electric Services, SIC code 4931 Electric and Other Services combined, and SIC code 4939 Combination Facilities Not Elsewhere Classified will be affected. However, expenditures by affected State, local, and tribal governments are not expected to exceed \$100 million in any one year. It is estimated that 244 public facilities will be affected and the estimated cost of compliance in the first year is \$8.4 million and \$5.4 million in subsequent years.

EPA is proposing this rule under sections 313 and 328 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and section 6607 of the Pollution Prevention Act of 1990 (PPA). EPA estimates that private expenditures will exceed the threshold of \$100 million in all years and that public expenditures will fall well below the threshold for all years.

EPA estimates that the costs of the proposed rule will be \$190 million in the first year and \$118 million in subsequent years. EPA estimates that the proposed regulation is highly unlikely to have any measurable effect on the national economy nor is it expected to have disproportional budgetary effects on a particular segment of the private sector. EPA has not identified any sources that are available from either EPA or other Federal Agencies to pay for State, local, or tribal government costs, nor has it identified any EPA or Federal resources specifically intended to carry out the intergovernmental mandate.

## CHAPTER 1

### BACKGROUND, STATEMENT OF NEED, STATUTORY AUTHORITY AND OVERVIEW OF ANALYSIS

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The Emergency Planning and Community Right-to-Know Act (EPCRA), also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, created a broad range of emergency response planning and reporting requirements for handlers of toxic chemicals in the United States. Under Section 313 of EPCRA, certain facilities are required to file annual reports to the United States Environmental Protection Agency (EPA) and States on their release(s) and transfer(s) of certain toxic chemicals if they exceed specific thresholds. In addition, the Pollution Prevention Act (PPA) of 1990 required these same facilities to report recycling and waste management information for these same chemicals. EPA maintains the data collected under EPCRA Section 313 and the PPA in a database known as the Toxics Release Inventory (TRI).<sup>1</sup>

The statute applied the requirements of EPCRA Section 313 only to manufacturing industries, but gave EPA the authority to modify the list of industry groups subject to reporting. EPA is now evaluating the potential to expand reporting requirements to include certain non-manufacturing industry groups.

This report analyzes the economic impacts of expanding the coverage of EPCRA section 313 to include additional industry groups. The following industry groups were considered potential candidates for this expansion prior to the completion of the screening process:

- Metal mining;
- Coal mining;
- Nonmetal mining;
- Railroads;
- Trucking and warehousing;
- Air transportation;
- Pipelines;
- Transportation services;
- Electric, gas and sanitary services;
- Wholesale trade; and
- Solvent recovery services.

In order to understand the effects of the expansion, it is first necessary to understand how EPCRA Section 313 and TRI currently operate. This chapter provides that background information. It begins with a description of the statutory and regulatory history behind TRI. This is followed by a summary of the TRI reporting requirements and how the data has been used. The chapter concludes with a description of the need for TRI, and the statutory authority for expanding the program.

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<sup>1</sup> The term *EPCRA Section 313* properly refers to only the statutory requirements, while the term *TRI* properly refers to the database where the information collected under Section 313 and under section 6607 of the PPA is stored. However, the terms have often been used interchangeably by the public to refer to the statute, the regulatory requirements, the reporting form, the database, and EPA's program to manage the data. In deference to common usage, the terms EPCRA Section 313 and TRI are sometimes used interchangeably in this report where doing so will make the report simpler and easier to read.

## 1.1 STATUTORY AND REGULATORY HISTORY

### 1.1.1 PASSAGE OF EPCRA

In 1986, Congress passed EPCRA, which is also known as Title III of SARA. The law was passed in response to the accidental release of methyl isocyanate gas in Bhopal, India in December, 1984 and a number of chemical accidents in the U.S., including one in Institute, West Virginia. EPCRA is based on the premise that citizens have the right to know about chemicals in their communities. The broad purposes are to encourage community planning for response to accidental chemical releases, and to provide the public and government agencies with information about the presence, release and management of toxic chemicals in communities.

EPCRA contains four main provisions:

- Planning for chemical emergencies (Sections 301-303);
- Emergency notification of chemical accidents and releases (Section 304);
- Reporting of hazardous chemical inventories (Sections 311-312); and
- Toxic chemical release reporting (Section 313).

Because this rulemaking would affect only Section 313 (and not the other sections of EPCRA), the remainder of this overview deals only with Section 313 (i.e., TRI).

### 1.1.2 OVERVIEW OF TRI

The regulations implementing EPCRA Section 313 were promulgated on February 16, 1988 (53 ER 4500) at 40 CFR Part 372. Under these regulations, owners or operators of covered facilities must complete the Toxic Chemical Release Inventory (TRI) Reporting Form R, which includes information on releases to air, water and land, as well as on-site waste treatment and transfers of the chemical in waste to off-site locations. Section 313 annual reports are required to be filed to EPA and the State by July 1 of the following year.

A completed Form R must be submitted for each toxic chemical manufactured, processed, or otherwise used at each covered facility as described in the reporting rule in 40 CFR Part 372. There are currently over 650 toxic chemicals and chemical compound categories on the list of TRI chemicals.

A facility must report under section 313 if it meets all three of the following criteria:

- (1) Is in a Standard Industrial Classification (SIC) code covered by the regulations. TRI currently covers the manufacturing sector, i.e., SIC codes 20-39;
- (2) Has 10 or more full-time employees (or the hourly equivalent of 20,000 hours); and
- (3) Manufactures, processes, or otherwise uses any of the listed toxic chemicals or chemical categories above the specific threshold. For chemicals manufactured (including imported) or processed the threshold is 25,000 pounds. For chemicals otherwise used the threshold is 10,000 pounds.

TRI is unique among environmental databases because of the multimedia data it collects, and because it was designed for public access. EPCRA requires that EPA compile a summary of the data

submitted under Section 313, and make this data available to the public by computer telecommunication or other means on a cost-reimbursable basis. EPA maintains the Section 313 data in the national Toxic Release Inventory (TRI) database. TRI data are available to the public in a variety of paper and electronic formats, including on disk, on-line, and on CD-ROM.

Section 313(h) of EPCRA states that data obtained pursuant to Section 313 are intended to provide information to the public as well as to Federal, State, and local governments. These data shall be used to inform the public about releases to the environment of the listed chemicals; to assist government agencies, researchers, and other persons conducting research and gathering data; to aid in the development of appropriate regulations, guidelines, and standards; and for other similar purposes.

### **1.1.3 POLLUTION PREVENTION ACT**

In 1990, Congress passed the Pollution Prevention Act (PPA), adopting as national policy an environmental hierarchy that established pollution prevention as the first choice among waste management options. For waste that cannot be prevented at the source, recycling is considered the next best option. Treatment or disposal should be turned to only after source reduction and recycling have been considered. The PPA also augmented the information available to the public under EPCRA section 313 by requiring facilities to report information on their pollution prevention and recycling activities on Form R. The data elements required by the Pollution Prevention Act are contained in Section 8 of the Form R.

### **1.1.4 CHANGES TO THE LIST OF CHEMICALS**

When Congress passed EPCRA it gave EPA an initial list of approximately 300 chemicals subject to TRI reporting. The statutory list was derived from separate chemical lists used in New Jersey and Maryland. Congress also included a provision in EPCRA to amend the list of chemicals. Under Section 313(d), EPA has the authority to add a chemical to the list if it determines that the chemical can cause or can be reasonably anticipated to cause:

- Adverse acute human health effects at concentration levels likely to result from continuous or frequently recurring releases by a facility;
- Cancer or teratogenic effects, serious or irreversible reproductive dysfunctions, neurological disorders, heritable genetic mutations, or other chronic health effects; or
- A significant adverse effect on the environment.

EPA may also delete a chemical from the list if it does not meet any one of these criteria. According to Section 313(e) of EPCRA, any person may petition EPA to add or delete a chemical from the list on the basis of whether or not it meets the above criteria. All changes to the list are made through notice-and-comment rulemaking.

As of March 1995, EPA had received 59 petitions under Section 313(e). Of these, 46 petitions were to delist chemicals, 10 petitions were to list chemicals, and three petitions were to modify existing listings. (However, several of the listing petitions covered multiple chemicals, so more chemicals have been the subject of listing petitions than delisting petitions.) EPA had denied 18 of the petitions and granted or partially granted 23 of them; seven petitions had been withdrawn as of March 1995, and the remaining 11 were pending, or had been proposed but not finalized.

EPA has also added chemicals to the list through its authority under Section 313(d). Most notably, EPA added 286 chemicals and chemical categories to the list of toxic chemicals under TRI on November 30, 1994 (59 FR 61432). The majority of these chemicals are pesticides. Many of the remainder are chemicals regulated or identified as concerns under other environmental statutes such as the Clean Air Act, the Clean Water Act and the Safe Drinking Water Act. The first reports for these chemicals were to be submitted to EPA in 1996, and the data will be available to the public in 1997.

#### **1.1.5 ALTERNATE THRESHOLD**

On November 30, 1994, EPA finalized the "TRI Alternate Threshold for Facilities with Low Annual Reportable Amounts" (59 FR 61488). This rule was intended to reduce the compliance burden associated with EPCRA section 313. It established a reduced reporting option for facilities where the annual reportable amount of a listed chemical released or managed does not exceed 500 pounds.<sup>2</sup> Such facilities have the option of applying an alternate manufacture, process or otherwise use threshold of 1 million pounds to that chemical, instead of the standard thresholds of 10,000 or 25,000 pounds. If a facility does not exceed the 1 million pound threshold, then that facility is eligible to submit a certification statement for that chemical in lieu of a full Form R.

The certification statement is a simplified reporting form that includes facility identification information and the identity of the chemical or chemical category being reported. The certification statement must be submitted on an annual basis for each eligible chemical, and the information on a certification statement will appear in the TRI data base in the same manner as information submitted on a Form R.

#### **1.1.6 EXECUTIVE ORDER 12856**

On August 3, 1993, Executive Order 12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements" was signed by the President (58 FR 41981). The Executive Order requires federal facilities to comply with EPCRA requirements beginning with the 1994 reporting year. The Executive Order also asks all federal agencies to set a voluntary goal of 50% reduction from baseline quantities of their releases and transfers by 1999.

### **1.2 SUMMARY OF TRI REPORTING REQUIREMENTS**

The previous section described the fundamentals of TRI reporting. This section provides a brief overview of several key requirements under the current TRI regulations that could affect reporting from new industries. (Although changes may be made if certain new industry groups are added, the existing requirements serve to frame the issues.) These descriptions are for the purpose of general background; they are not comprehensive, and are not intended to serve as guidance. More information on specific requirements is available in EPA's "Toxic Chemical Release Inventory Reporting Form and Instructions", or from the Emergency Planning and Community Right-to-Know Information Hotline.

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<sup>2</sup> The annual reportable amount is equal to the combined total quantities released, recycled, burned for energy recovery, treated or disposed of. It can be calculated as the sum of data elements 8.1 through 8.7 on Form R.

### 1.2.1 FULL-TIME EMPLOYEE DETERMINATION

Facilities are only covered by TRI if they have 10 or more full-time employees (FTE) or the equivalent (20,000 hours, where a full-time employee is defined as 2,000 work hours per year). All employees, including part-time and on-site contract employees, must be counted in the FTE determination. Therefore, the FTE determination depends on the total number of hours worked during the year, and not on the actual number of persons working.

### 1.2.2 DEFINITION OF A FACILITY

EPCRA section 329 defines a facility to mean "all buildings, equipment, structures and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person."

### 1.2.3 THRESHOLD DETERMINATIONS

Facilities must report to TRI if they manufacture, process, or otherwise use any of the listed chemicals above the reporting thresholds. For chemicals manufactured (including imported) or processed the threshold is 25,000 pounds a year; for chemicals that are otherwise used the threshold is 10,000 pounds a year. Threshold determinations of chemicals that are recycled or reused at the facility are based only on the amount of the chemical that is added during the year, not the total volume in the system. However, chemicals recycled off-site and returned to a facility are treated as the equivalent of newly purchased material.

The definitions of manufacture, process and otherwise use can be summarized as follows:

- **Manufacture** means to produce, prepare, compound or import a listed chemical, including the coincidental production as a byproduct or impurity.
- **Process** means the preparation of a listed chemical, after its manufacture, for distribution in commerce. For instance, a company that combines resins, solvents, pigments and additives to produce paint is processing the constituent chemicals.
- **Otherwise Use** encompasses any activity involving a listed chemical that does not fall under the definitions of "manufacture" or "process". For example, lubricants, cooling fluids, refrigerants, hydraulic fluids, cleaners, degreasers and catalysts are typically otherwise used by the facilities that consume them.

### 1.2.4 EXEMPTIONS

Under certain circumstances, the reporting requirements under Section 313 may not apply to a chemical activity. The following are the major exemptions from TRI reporting:

**Use Exemptions.** The following uses of listed chemicals are specifically exempted:

- **Use as a structural component of a facility.** For example, painting of the facility;
- **Use in routine janitorial or facility grounds maintenance.** Examples include bathroom cleaners and fertilizers or pesticides used to maintain lawns. The exemption

applies only when the chemicals are used in the same form and concentration as commonly distributed to consumers;

- **Personal uses by employees or other persons.** For example, office supplies such as correction fluid and copier machine fluid;
- **Use for the purpose of maintaining motor vehicles operated by the facility.** This exemption includes such chemicals as gasoline, diesel fuel, brake and transmission fluids, oils and lubricants, antifreeze, batteries and cleaning solutions; or
- **Chemicals contained in intake water or in intake air.** This exemption covers the use of toxic chemicals present in process water and non-contact cooling water as drawn from the environment or from municipal sources, or toxic chemicals present in air used either as compressed air or as part of combustion.

**De Minimis.** The amount of chemical present in a mixture which is processed or otherwise used does not need to be counted if its concentration is less than 0.1 percent of the mixture for chemicals defined as carcinogens by the Occupational Safety and Health Administration (OSHA), or less than 1 percent of the mixture for all other chemicals. The *de minimis* limitation does not apply to wastestreams or to chemicals coincidentally manufactured as byproducts (e.g., a toxic chemical that is separated from a process stream and further processed or disposed).

**Transportation.** EPCRA provides an exemption for the transportation of chemicals. According to Section 327, only the emergency notification requirements in Section 304 apply to the transportation of chemicals or their storage incidental to transportation. The remaining requirements of EPCRA, including TRI reporting, do not apply. The conference report for EPCRA clarifies that the exemption relating to storage is limited to materials which are still moving under active shipping papers and which have not reached the ultimate consignee.

**Articles.** A facility is not required to account for chemicals in articles processed or used at the facility. An article is a manufactured item: (1) that is formed to a specific shape or design during manufacture; (2) that has end use functions dependent in whole or in part upon its shape or design during end use; and (3) that does not release a toxic chemical under normal conditions of processing or otherwise use.

For example, the chemical constituents of a large metal sheet are not reportable because the chemicals are part of an article. If the sheet is cut into pieces, the chemicals in the pieces may also be considered to be part of an article. However, if during the course of the reporting year more than one-half pound of a TRI chemical in the product is released (e.g., fugitive emissions, shavings that are not recovered) then a facility must examine the total quantity of the TRI chemical in the product, not just the portion released, and make a threshold determination for TRI reporting.

Similarly, a closed item containing a listed chemical (e.g., a transformer containing PCBs) that does not release the toxic chemical during normal use may be considered an article. If the facility services the closed item (e.g., a transformer), the chemical added during the year must be counted in threshold and release calculations.

**Laboratory Activities.** Chemicals that are used for research or quality control under the supervision of a technically qualified individual do not need to be counted. This exemption does not apply to pilot plant scale operations or laboratories that distribute chemicals in commerce.

### 1.2.5 READILY AVAILABLE DATA

According to Section 313(g)(2) of EPCRA, facilities may use readily available data to report to TRI. By law, no additional monitoring or measurement of quantities, concentrations, or frequency of release of any listed chemical is required for the purpose of reporting to TRI. The required information may be obtained from readily available data that are collected pursuant to other provisions of law or as part of routine plant operations. When such data are not available, reasonable estimates, using such methods as published emission factors, materials balance calculations or engineering calculations, are sufficient. Readily available data may also be used if monitoring data are known to be non-representative.

### 1.2.6 OTHER

#### SIC Code Determination

Facilities are subject to TRI reporting if they are in a listed SIC code. Currently, facilities in the manufacturing sector (SIC codes 20-39) are covered. This encompasses the following industry groups:

SIC	INDUSTRY GROUP
20	Food
21	Tobacco
22	Textiles
23	Apparel
24	Lumber and Wood
25	Furniture
26	Paper
27	Printing and Publishing
28	Chemicals
29	Petroleum Refining
30	Rubber and Plastics
31	Leather
32	Stone, Clay, Glass and Concrete
33	Primary Metals
34	Fabricated Metals
35	Machinery
36	Electrical and Electronic Equipment
37	Transportation Equipment
38	Measuring, Analytical and Control Instruments
39	Miscellaneous Manufacturing

Facilities with multiple SICs are covered if their primary SIC code is within 20-39. Some facilities have multiple establishments at the same site, with some establishments that are in SIC codes covered by TRI and others that are outside the covered SIC codes. Such facilities must calculate the value of products produced or shipped from each establishment within the facility. If establishments within covered SIC codes account for either a majority or a plurality of the total value of the products shipped from or produced at the facility, the entire facility meets the SIC code criterion. A covered multi-establishment facility must make threshold determinations and, if required, must report to TRI for the entire facility, even from establishments that are outside covered SIC codes.

## Range Reporting

Facilities with total annual releases or off-site transfers of less than 1,000 pounds of a listed chemical can report these quantities in ranges (1-10 lbs, 11-499 lbs, or 500-999 lbs) instead of as point estimates. It is believed that there is a lower reporting burden to provide ranges than point estimates.

## Recordkeeping

Facilities must keep a copy of each Form R filed for at least three years from the date of submission. Facilities must also maintain those documents, calculations, worksheets, and other forms upon which they relied to gather information for Form R reports. EPA may request documentation to support submitted information or conduct data quality reviews of submissions.

## Chemical Categories

A chemical category contains several individual chemicals having similar characteristics and is considered to be one chemical for the purpose of TRI reporting. EPCRA section 313 requires threshold determinations for chemical categories to be based on the total of all chemicals in the category manufactured, processed or otherwise used. For example, a facility that manufactures three members of a chemical category would count the total amount of all three chemicals manufactured towards the manufacturing threshold for that category. When filing reports for chemical categories, the releases are determined in the same manner as the thresholds. One report is filed for the category and all releases are reported on this form.

About half of the categories are for metal compounds. These generally contain any unique chemical substance that contains the parent metal as part of that chemical's infrastructure. For instance, the arsenic compounds category includes any chemical substance containing arsenic, and the lead compounds category contains any chemical substance containing lead. Some categories are limited to a class of chemicals. For instance, the cyanide compounds category includes any unique chemical described by  $X^+CN^-$  where  $X=H^+$  or any other group where a formal dissociation may occur (for example KCN or  $Ca(CN)_2$ ). And other categories (for instance polycyclic aromatic compounds) are delimited, and only certain listed chemicals are included under the category designation.

Most chemical categories are made up of chemicals that are structurally similar or contain similar functional groups and that cause similar toxic effects. For example, the polycyclic aromatic compounds category contains chemicals that are structurally similar and have the same toxicity concern (cancer). However, the chemicals in the metal compounds categories have widely varying structures but they all contain the same metal component which has the same toxicity concern.

## Trade Secrets

A facility may claim the specific identity of a chemical as a trade secret, but the rest of the report (whether Form R or certification statement) must be completed. To make a trade secrecy claim, the facility must submit two versions of the report (one that identifies the chemical and the other with generic chemical identity instead of the real chemical name) and a trade secret substantiation form. Examples of generic chemical identities might include ketone (for methyl ethyl ketone), mineral acid (for nitric acid) or CFC (for dichlorodifluoromethane). Since there are multiple chemicals on the Section 313 list that could be described by one of these generic identities, the specific identity of the chemical would not be disclosed.

### 1.3 PUBLIC ACCESS TO AND USES OF THE TRI DATA

Section 313(h) states that data obtained pursuant to Section 313 are intended to provide information to the public as well as to Federal, State, and local governments. The TRI program serves the important function of making data available to inform the public about releases to the environment of the listed chemicals; to assist government agencies, researchers, and other persons conducting research and gathering data; to aid in the development of appropriate regulations, guidelines, and standards; and for other similar purposes. Data submitted to EPA in compliance with Section 313 are maintained in the national Toxic Release Inventory (TRI) data base, and are accessible to any person on a cost-reimbursable basis.

EPA makes the TRI data available through a variety of formats including hard copy of Form R reports, diskettes containing Form R reporting information, annual reports summarizing TRI data nationally and state-by-state, and CD-ROM versions of annual TRI data. Recently, EPA began making TRI information available through Internet access. With its broad dissemination, TRI data has enjoyed extensive use by the public. Facilities have used the data obtained through TRI to better understand their operations, and make better use of pollution prevention opportunities. Community groups have used the data to educate themselves of the presence of toxic chemicals in their communities, and have used that increased information to engage in meaningful, productive dialogue with local industry and with all levels of government. In general, TRI data has proven a powerful tool in environmental decision making.

### 1.4 STATEMENT OF NEED

Federal regulations are used to correct significant market failures. Markets will fail to achieve socially efficient outcomes when differences exist between market values and social values. One type of market failure occurs when one party's actions impose uncompensated costs or benefits on another party outside the marketplace. For example, a manufacturing facility releasing toxic chemicals to the environment may impose environmental and health risks on the residents of the adjacent community. Although created by the manufacturing facility, it is the community rather than the facility that bears the cost of these risks. The EPCRA Section 313 reporting requirements were designed to address this market failure, at least in part, by providing information to the public and federal, state, and local governments regarding the release of over 600 chemicals and chemical categories to the environment. The public is expected to use this information in three important ways. First, they will use information on chemical releases in their communities to pressure polluting companies to reduce their releases of toxic chemicals. Second, as consumers they will use this information to differentiate between the products they purchase thus bringing economic pressure to bear on polluting companies. Third, the public will use the information to make better informed decisions on where to work and live. Governments will use the information to identify hot spots, set priorities, evaluate ecological and human health risks, and design better, more informed regulations. In addition, elements of society apart from government and the public may use the information to make decisions. For example, the information enhances the ability of corporate lenders and purchasers to more accurately gauge a facility's potential environmental liabilities. The following discussion first provides a review of the theory of market failure and how it can be corrected, and then describes the role that TRI can play in correcting a specific market failure.

### 1.4.1 THE THEORY OF MARKET FAILURE

The theory of modern welfare economics states that allocative efficiency or "pareto efficiency" is achieved when it is impossible to change the allocation of resources in such a way as to make someone better off without making someone else worse off. More precisely, economic theory states that allocative efficiency occurs: where consumers' marginal benefit exactly equals the producer's marginal cost (Samuelson and Nordhaus, 1985). Graph 1 (Figure 1) illustrates the pareto efficient allocation of resources. Where the two curves cross, a price is set such that demand equals supply and the benefit from consuming one more unit exactly matches the cost of producing it. If output were higher, the cost of producing any additional units will exceed their marginal value. Conversely, any decrease in the number of units produced will result in a situation where the benefit of consuming more will exceed the costs of production.

In Graph 2 (Figure 1), the upper shaded area indicates the difference between the price consumers actually pay for a good and the price consumers would have been willing to pay rather than do without. This difference is known as consumer surplus (area A). The lower region reflects the producer surplus (area B): revenues received less the costs of production. The total welfare gain (consumer and producer surplus) is maximized at the efficient quantity  $Q_1$ . If the economy fails to achieve this efficient output, society suffers a loss in potential welfare, what economists call a deadweight loss. Graphs 3 and 4 (Figure 1) illustrate the deadweight loss (area C) incurred from producing too little or too much of a good, respectively.

The allocation of resources generated by the interaction of supply and demand, however, will not always be desirable from the standpoint of society. The market will fail to achieve a socially efficient outcome when differences exist between market values and social values. The economic literature identifies four causes of market failure: externalities, public goods, market power (i.e., monopoly, monopsony, and oligopoly), and information asymmetries. The following discussion focuses on externalities and information asymmetries.

In the case of externalities or external costs, the actions of one economic entity imposes costs on parties that are "external" to the market transaction. For example, in the performance of manufacturing and other business activities, entities may release pollution or cause other environmental harm without accounting for the consequences of these actions on other parties who do not directly participate in the business transactions of the trading entities. These costs are not recognized by the responsible entity in the conventional market-based accounting framework. Because these costs are not reflected on the responsible entity's balance sheet, they are not considered in the consequent production and pricing decisions of the firm. For example, a company that produces and/or uses hazardous chemicals will pay for labor and capital but will not pay for environmental damages resulting from their emissions of these hazardous chemicals. Economists refer to such costs as external costs or externalities.<sup>3</sup> To the extent that these externalities are negative (i.e., impose costs on society), an overproduction and overuse of environmentally hazardous chemicals will occur (Mills and Graves, 1986).

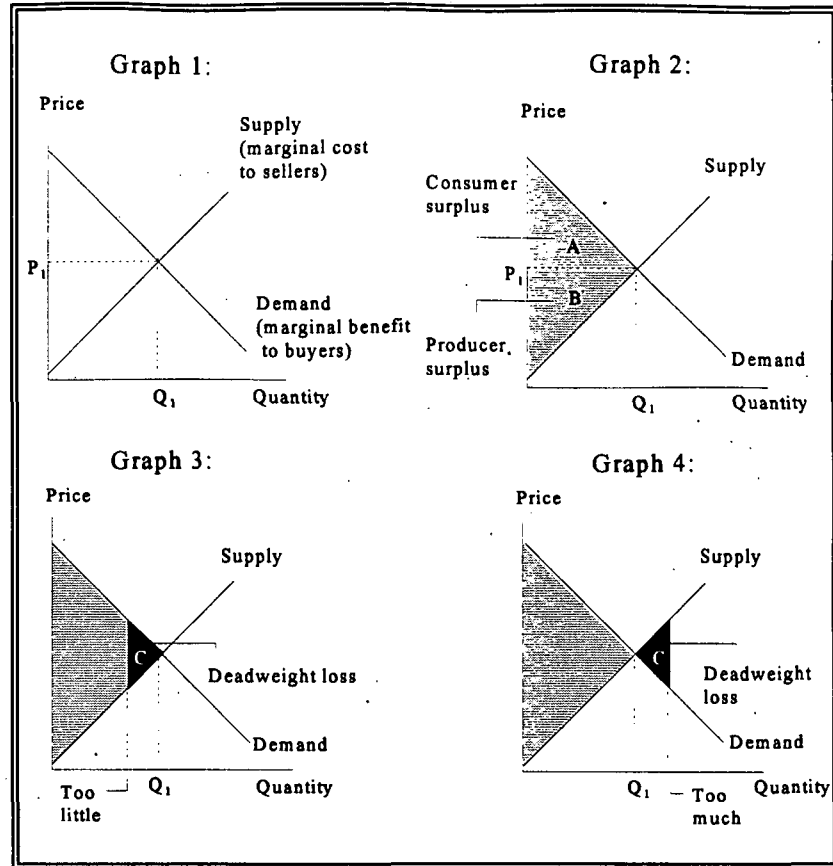
Graph 1 (Figure 2) illustrates the over-production of goods due to the existence of external costs. The private marginal cost curve differs from the social marginal cost curve (private costs + external costs). The distance between the social marginal cost curve and the private marginal cost curve represents the cost to society imposed by the externality. The outcome is a pricing structure such that  $Q_2$

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<sup>3</sup> The origin of modern externality theory can be traced back to John Stuart Mill's *Principles of Political Economy*, Alfred Marshall's *Principles of Economics*, and A.C. Pigou's *Wealth and Welfare*.

Figure 1: Market Efficiency

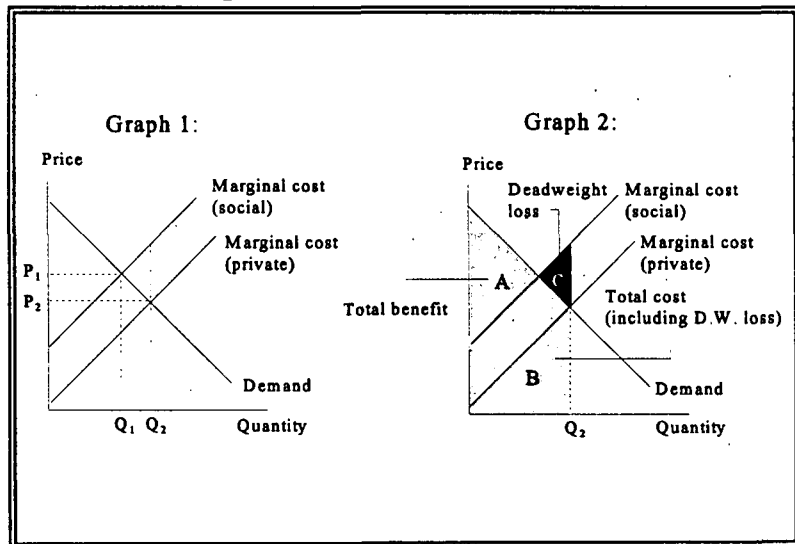
units are produced at price  $P_2$ . If the external costs were fully internalized and producers were in fact operating on the social marginal cost curve, the socially efficient quantity  $Q_1$  would result and consumers would pay a higher price at  $P_1$ . The social loss associated with the production of  $Q_2$  is shown by the dark shaded area (area C) in graph 2 (Figure 2) which corresponds to the amount of over production that would result if producers were operating on the private marginal cost curve instead of the social marginal cost curve. The deadweight loss is the difference between total costs (area B and C) and total benefits (area A). This is the same deadweight loss that was illustrated in Graph 4 (Figure 1).



The market may also fail to efficiently allocate resources in cases where consumers systematically lack perfect information. In economic theory, perfect information among buyers and sellers is required for individuals to make rational decisions, and ultimately for markets to reach equilibrium and thus for resources to be efficiently allocated. There are at least three ways in which information is not, in fact, perfect, which potentially diminishes the efficiency of individuals' decisions: 1) there may be variation in the amount of information held by different

market participants (producers and consumers), affecting their potential to realize gains from trading; 2) there may be uncontrollable uncertainty that affects all outcomes, such as how much rainfall will be available to grow a particular crop; and 3) consumers may not have sufficient information that is potentially available to make rational decisions, and may or may not be aware of their limitations. This

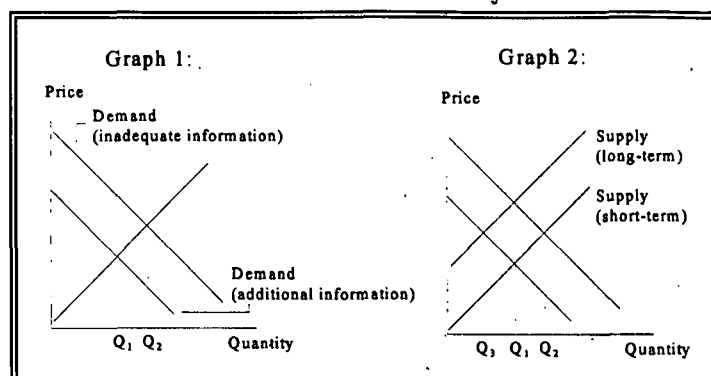
Figure 2: Sources of Market Failure



discussion is limited to the third type of imperfect information. Lacking full information of the consequences of their purchases, consumers may over-value or under-value a particular good in question. When consumers lack information regarding the negative consequences of their purchases, the result will be a misallocation of resources due to excess demand for the particular good in question. For example, increased awareness of the health hazards associated with smoking has resulted in a permanent decrease in the demand for cigarettes (Parkin, 1990). While producers have a strong incentive to inform consumers of the positive aspects of their products in order to increase demand, a firm does not ordinarily have an incentive to furnish consumers with information regarding the negative consequences associated with their product's use or production, such as the release of toxic chemicals to the environment.

Graph 1 (Figure 3) illustrates a shift in demand and reduction in the production quantity due to the provision of information. When furnished with full information, consumer demand shifts inward, resulting in a short-term pricing structure such that the quantity  $Q_1$  is produced. Following a permanent decrease in demand, the market price will fall and some firms will leave the industry. As producers leave the industry, the supply curve shifts to the left and the equilibrium price will gradually rise back to its original level as the market returns to a state of long-term equilibrium (Parkin, 1990). Graph 2 (Figure 3) illustrates this shift in supply resulting in a further reduction in the efficient quantity to  $Q_3$ .

**Figure 3: Information Provision and Efficiency**



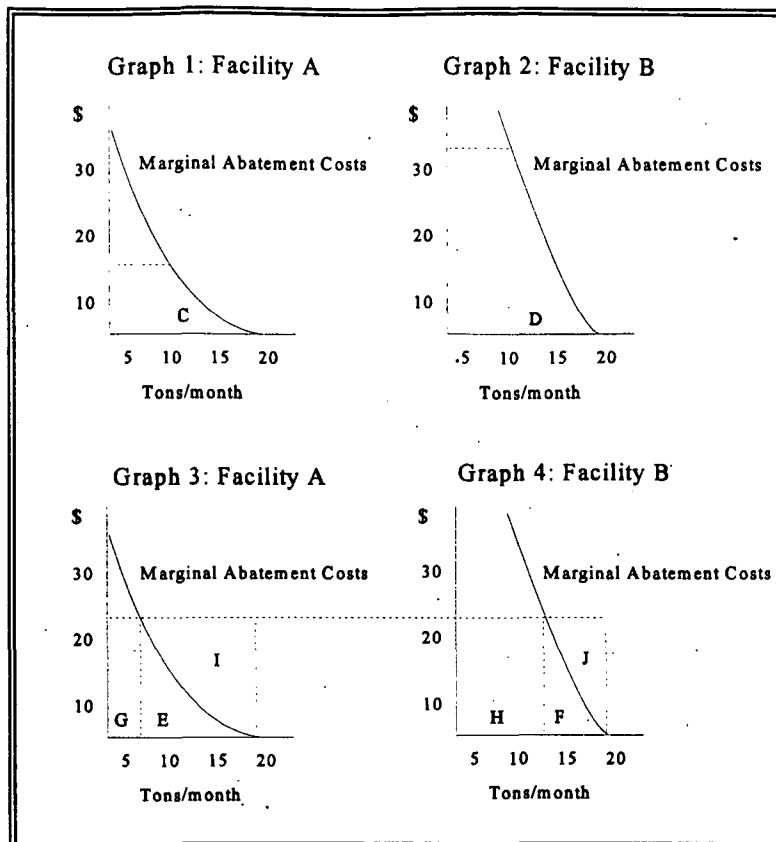
In the event of a significant market failure, public intervention is often required to override the market directly or to configure market incentives in order to achieve a more socially efficient outcome.<sup>4</sup> Several alternative approaches are available to address market failure and to move society closer to an efficient allocation of resources: command-and-control (C&C) strategies, incentive-based strategies, and information-based strategies. C&C strategies set standards for the quantities of pollutants a source may

<sup>4</sup> Economists have argued that it is theoretically possible for the firm to negotiate with members of the community about payments to compensate them for the damages they suffer, yielding an efficient distribution of resources even in the presence of externalities (Davis and Hulett, 1977). In his article *The Problem of Social Cost*, R. H. Coase suggests that public intervention is not necessary to correct market imperfections because the affected party may be able to bribe the producer of the externality to reduce their activities which result in external costs. Theoretically, the affected party would be willing to offer a "bribe" for incremental pollution reductions up to the point where marginal abatement costs and marginal damages are equal. Both parties would be better off up to this point because the incremental payments made by the affected party will not exceed their marginal damages (the affected party benefits) and the payments received by the firm will exceed their marginal costs of pollution abatement (the polluter benefits). A socially efficient level of production is achieved (the equity implications of this solution are not factored into this outcome). For the proper operation of the Coase Theorem, several conditions (which are often unmet in cases of environmental pollution) must be present: 1) property rights must be well defined, enforceable, and transferable; and 2) transaction costs must be minimal in order to allow negotiation to occur (Field, 1994).

release. This approach is typically implemented by mandating specific control technologies (design standards) or specific environmental targets (performance standards). C&C strategies have been widely criticized within the economic literature on several grounds. By imposing a uniform standard across all facilities without consideration of the relative costs of emissions control, the standards approach forgoes possible savings that could be achieved by reallocating emissions reductions among firms in such a way as to achieve the same overall reductions but at a lower cost.

Figure 4 illustrates the inefficiency of a standard as it applies to two facilities (A and B). Graphs 1 and 2 illustrate the marginal abatement costs -- the added costs of achieving a one-unit decrease in emission level -- faced by facilities A and B. In both cases, marginal abatement costs increase as greater emission reductions are achieved. Also, marginal abatement costs for any level of emissions are lower for facility A. This situation may result because facility B is older and more expensive to retrofit with pollution control devices. Because marginal abatement costs vary between facility A and B, the standards approach, whether design standards or performance standards, will fail to minimize total abatement costs. Assuming that a maximum emission limit of 10 tons/month is set for both facilities, facility A will incur compliance costs equal to area C (Graph 1) and facility B will incur compliance costs equal to area D (Graph 2).<sup>5</sup> However, emission reductions can be reallocated between facilities A and B in such a way as to achieve aggregate abatement costs lower than area C + D. Graphs 3 and 4 illustrate the most efficient (i.e., least cost) allocation of emission reductions that still achieves a total reduction of 20 tons/month. By reducing emissions to roughly 6 tons/month at facility A and roughly 14 tons/month at facility B, aggregate abatement costs (E + F) are minimized. In all cases, aggregate abatement costs across firms are minimized where marginal abatement costs are equal (in graphs 3 and 4, roughly \$21).<sup>6</sup> Total reductions are equal to those achieved

Figure 4: The Inefficiencies of Standards



<sup>5</sup> Graphs in Figure 4 should be read from right to left, with marginal abatement costs increasing as greater emission reductions are achieved. The area below the marginal abatement cost curve indicates the total costs of abatement. Left unregulated facility A and B will release 20 tons/month of emissions.

<sup>6</sup> The equimarginal principle states that aggregate costs across facilities are minimized where marginal costs are equal. The principle is not only relevant to pollution abatement costs, but also applies to any situation in which marginal costs vary. For example, a shoe manufacturer that operates multiple facilities may ask how to allocate production of 10,000 shoes across 12 different facilities

under the uniform standard (i.e., 20 tons/month), however, total abatement costs are minimized. To the extent that marginal abatement costs vary across firms, uniform standards will create inefficiencies in the allocation of emission reductions. We will see below that the incentive approach creates a mechanism by which emission reductions occur at least cost by equalizing marginal abatement costs across firms.

Thus far, the discussion has focused on the inefficiency of a uniform standard in achieving a specific emission level. This is a question of cost-effectiveness --- does our regulatory approach achieve a given emission level at least cost? In order to insure an efficient allocation of resources, however, emissions must not only be reduced at least cost but must also be reduced to an efficient level. Recall that the efficient allocation of resources occurs where marginal benefits equal marginal social costs (Figures 1 and 2). If a standard is set such that emissions are too high or too low, a deadweight loss will result. In Figure 4, emissions were reduced to 20 tons/month. In order to determine if 20 tons/month is the efficient level of emissions, the regulating agency requires data to estimate the shapes of the aggregate marginal cost curve as well as the aggregate marginal benefit curve. Information such as total releases, marginal abatement costs, and human and environmental damages are required to estimate an efficient level of emissions. Assuming that 20 tons/month is the efficient level, Figure 4 illustrates that a uniform standard may achieve efficiency, but will not do so at least cost.

In addition to their efficiency short-comings, command-and-control strategies will sometimes discourage technological innovation or create a weaker incentive for innovation than the incentive-based approaches discussed below. In the case of a technology based standard, firms will tend to adopt the technology mandated by the standard regardless of whether a better (i.e., less expensive) alternative exists. Better to insure compliance than attempt to justify the merits of an alternative approach. In the case of a technology based standard, no incentive exists for research and development (R&D). When faced with a performance standard, the incentive for engaging in R&D equals any avoided compliance costs; however, as we will see below, this is a weaker incentive than is created by the incentive approach (Field, 1994). Both the incentive approach as well as the information based strategies have advantages compared to the standards approach.

Incentive strategies, rather than mandating a uniform standard across all generators, place a price on every unit of pollution creating an incentive for emitters to reduce their emissions. The most common approach is to set a charge per unit of pollution; however, other alternatives are also suggested in the literature, including tradeable discharge permits and abatement subsidies (Field, 1994). The following discussion focuses entirely on emissions charges, however, the general theory is applicable to all incentive strategies.

Several studies have been conducted supporting the efficiency advantages of incentive strategies while simultaneously revealing the unnecessary costs imposed by the command and control approach. The most widely known sources include: *Pollution, Prices, and Public Policy* by Allen Kneese and Charles Schultze, *The Public Use of Private Interest* by Charles Schultze, and *Economics of the Environment*, a collection of essays edited by Robert and Nancy S. Dorfman. Incentive type approaches are able to reduce the same quantity of emissions at a lower cost compared to command-and-control strategies because an incentive is created for reductions to occur where it is least costly to do so. For example, a charge per ton of SO<sub>2</sub> will create an incentive for firms to reduce their emissions until their marginal cost of reducing one additional ton exceeds the per ton emissions charge. Firms that can economically reduce their SO<sub>2</sub> emissions will do so, while others may choose to incur the cost of the fee.

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while minimizing aggregate production costs. The answer is to allocate their production such that marginal costs are equal across all facilities (Field, 1994).

Higher emission charges will induce greater emissions reductions just as a reduction in the emissions charge will increase emissions.

Returning to Graphs 3 and 4 (Figure 4), we can illustrate that an emissions charge will automatically lead to the most efficient allocation of emissions reductions (i.e., where marginal abatement costs are equal). By establishing a fee of \$21/ton /month, an incentive is created for facility A to reduce emissions to roughly 6 tons/month. By reducing emissions to 6 tons/month, facility A incurs total fee payments equal area G and total abatement costs equal to area E. If facility A were to continue emitting 20 tons/month and incur the entire cost of the fee, total fee payments would equal area G + E + I. Assuming that facility A and B are operating in a competitive market, they will reduce their emissions up to the point where marginal abatement costs are equal to the per ton fee, effectively minimizing their total costs (i.e., emissions fee plus abatement costs). Facility B, operating under the same competitive pressures, will reduce emissions to roughly 14 tons/month, incurring costs equal to area H (fee payment) and F (abatement cost). Because of the incentive created by an emissions fee, emission reductions will automatically be allocated such that abatement costs are minimized. In addition, the incentive to engage in research and development efforts is stronger under an emissions fee compared to a standard. Recall that the incentive for R&D under an emissions standard is equal to avoided compliance costs. In contrast, the incentive to engage in R&D under an emissions fee is equal to avoided compliance costs plus any avoided fee payments.

While an emissions charge will insure that reductions occur at least cost, it will not insure an efficient allocation of resources. In order to achieve an efficient allocation of resources, an emissions fee must be set such that marginal benefits equal marginal social costs. If an emissions fee is set too high or too low, a deadweight loss will result. As with the standards approach, the regulating agency requires data in order to estimate the shapes of the aggregate marginal cost curve and the aggregate marginal benefit curve. An alternative option would be to establish an emissions fee, then observe ambient pollution levels and determine if a socially efficient outcome results. If ambient pollution levels decrease by too much or too little, the fee would then be lowered or raised as appropriate. Such an approach, however, is likely to be enormously disruptive to industry. Industry is likely to respond to an emissions charge by investing in costly pollution-control technology. Any changes in the emissions fee are likely to disrupt capital investment plans, placing a further premium on accurate data to estimate an appropriate emissions charge from the beginning. Although an emissions fee may not always achieve an efficient level of pollution, it will allocate reductions at least cost.<sup>7</sup>

The third approach to addressing the existence of external diseconomies is information-based strategies. As in the case of incentive strategies, information-based strategies provide an alternative to command-and-control approaches which are more market oriented. Specifically, they can lead to more cost-effective reductions in chemical emissions by allowing facilities the flexibility to decide whether and how to make reductions. The various approaches are quite varied: government testing and rating systems, mandatory disclosure requirements such as labeling and periodic reporting, and government provision of information. As illustrated above, the provision of information works to internalize costs by informing consumers of the external economies and diseconomies associated with their purchasing

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<sup>7</sup> In contrast, an emissions standard will not always achieve an efficient level of pollution and is unlikely to allocate reductions at least cost. In order for an emissions standard to minimize abatement costs, all facilities must operate under the same marginal abatement cost structure.

decisions.<sup>8</sup> Consumers may respond to the additional information by changing their purchasing decisions (increasing or decreasing their consumption), by changing the way they use a product, or by altering their choice of where to live and work.<sup>9</sup> In cases where the market is unlikely to provide adequate information, public intervention is sometimes required to provide consumers with information that will allow them to make these decisions efficiently.

#### 1.4.2 THE EFFECT OF TRI INFORMATION ON MARKET FAILURE

Through the provision of toxic chemical release data, the Toxics Release Inventory (TRI) overcomes firms' disincentive to provide information on their toxic releases and moves society toward an efficient allocation of resources in three important ways:

1) *By allowing more informed decisions to be made by society, consumers, and corporate lenders, purchasers and stockholders.* According to OMB guidance, "If intervention is necessary to address a market failure arising from inadequate information, informational remedies will generally be the preferred approaches. As an alternative to a mandatory standard, a regulatory measure to improve the availability of information has the advantage of being a more market-oriented approach. Thus, providing consumers information about concealed characteristics of consumer products gives consumers a greater choice than banning these products" (OMB, 1996). In the case of toxic chemical releases, however, it is not just consumers that are affected.<sup>10</sup> Rather, society at large is affected by the release of toxic chemicals into their communities. It is society that bears the burden of the externality and society that requires information on toxic chemical releases in order to make rational decisions regarding such things as where to live and work.

By informing society of the toxic chemical releases in their communities, an incentive is created for industry to reduce their emissions. Release data holds the potential to adversely affect a company's public image and companies may respond to that possibility whether their concern be real or perceived. Santos, Covello, and McCallum surveyed 221 facilities subject to TRI reporting and found that nearly all facilities had reported reduced emissions and half had increased their environmental communication activities despite the fact that public inquiries did not increase. The authors interpret their results as an indication that the mere potential for adverse public reaction may provide an important motivator for emissions reductions (Santos et al., 1996). Information provision will not correct the entire market failure. However, to the extent that companies "perceive" that their public image will be adversely affected by the public dissemination of toxics release data, they will respond by reducing emissions. Concerns are most likely to exist when facility releases per unit of production (which can be calculated using TRI data in conjunction with production data) are higher than average within their industry or

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<sup>8</sup> Provision of information may be at least one step removed as in the case where the hazard associated with a product may be attributable to an input, not the final product.

<sup>9</sup> Information provision may also influence how consumers allocate their time, in addition to how they allocate their purchasing decisions. For example, information regarding the health benefits of regular exercise may encourage consumers to allocate more of their time to exercise.

<sup>10</sup> TRI data does not provide total chemical releases for a consumer ready product, therefore, demand changes attributable to TRI are assumed to be limited. In addition, the external costs of toxic chemical releases are not always borne by the consumer of the product, further diminishing the likely impact on consumer demand.

releases are increasing over time. Such determinations could not be made without the inter-temporal and inter-facility data provided by TRI.

In addition to informing affected communities and consumers, the information provided by TRI enhances the ability of corporate lenders, purchasers, and stockholders to more accurately gauge a facility's potential environmental liabilities, again, resulting in better informed decision making. Investors who are unaware of a firm's emissions may overvalue their stock because they have inadequate information regarding the company's potential liability, abatement expenditures, and fines. Better information will help stockholders to more accurately value the stock (see Hamilton, 1995).

2) *By providing vital information for the efficient design and targeting of federal, state, and local enforcement and regulatory programs.* Toxic chemical release data is used by government to identify hot spots, set priorities, and monitor trends, all of which can yield more informed decisions. For example, the Office of Air and Radiation (OAR) has used TRI data for a variety of tasks related to the implementation of the Clean Air Act Amendments of 1990 (CAAA): 1) TRI data have been used in setting research priorities for the 189 Hazardous Air Pollutants (HAPs) identified in the CAAA; 2) TRI data are used by OAR to target potential sources for inclusion in the Early Reductions Program (a means of achieving enforceable reductions of toxic emissions before a regulation is in place); and 3) TRI facility-level locational data are being used in conjunction with other demographic data to improve exposure assessment (U.S. EPA, 1995). TRI data is unique in that it allows comparison between firms within the same industry as well as across industries, again yielding better informed decisions in the design of regulations as well as in the development of voluntary programs. Moreover, because of the way the information is disseminated, such decisions do not have to be made by the federal government, but can also occur at the state or local level. TRI data will not fully internalize the external costs associated with the release of toxic chemicals; however, to the extent that TRI contributes to the efficient design of new regulations and voluntary programs, the external costs are likely to be addressed in an efficient manner.

3) *By informing facilities of opportunities to reduce emissions.* TRI information provides facilities with important information for judging their own performance and may alert them to opportunities for the implementation of pollution prevention or recycling projects. In some cases, firms may change their behavior by increasing recycling or treatment efforts without affecting the marginal costs of production. In such cases, emissions may be reduced without any affect on consumption.

TRI does not provide complete information on the costs of toxic chemical releases and does not result in the full internalization of external costs. However, the dissemination of information through TRI mitigates two causes of market failure: incomplete information and externalities. By addressing these market failures, TRI moves society closer to an efficient allocation of resources and increases social welfare. Addressing the market failure through information provision avoids inefficiencies inherent in command and control regulations. Also, to the extent that TRI informs regulating agencies of the marginal costs and benefits associated with the release of toxic chemicals, inefficiencies associated with incentive strategies may be avoided.

## 1.5 STATUTORY AUTHORITY

Section 313(b)(1)(A) of EPCRA applies the reporting requirements only to manufacturing facilities, i.e., facilities in Standard Industrial Classification (SIC) codes 20 through 39. However, Section 313(b)(1)(B) grants EPA the authority to add or delete industry groups to the program. Therefore, the expansion of the TRI program to additional industries is within the legislative mandate. In addition, Section 313(b)(2) allows EPA to add facilities on the basis of the toxicity of the chemicals

manufactured, processed or otherwise used at a facility, the proximity to other facilities that release the toxic chemical or to population centers, the history of releases of such chemical at the facility, or other such factors as EPA deems appropriate. EPA is authorized under Section 328 of EPCRA to promulgate regulations as necessary to carry out the purposes of EPCRA.

## 1.6 PURPOSE AND SCOPE OF THIS REPORT

This report examines the potential increase in reporting that would result from expanding the TRI program to additional non-manufacturing industry groups. The industry groups considered in this analysis are:

- **SIC Code 10 - Metal Mining.** SIC code 10 includes establishments<sup>11</sup> primarily concerned with mining, developing mines, or exploring for metallic minerals. This SIC code includes all ore dressing and beneficiation processes including mills which crush, grind, wash, leach, and perform gravity flotation operations. Smelters and refineries are not included in this SIC code.
- **SIC Code 12 - Coal Mining.** SIC code 12 includes establishments primarily concerned with extracting and beneficiating bituminous coal, anthracite, and lignite. This SIC code includes mining operations and preparation plants (also known as cleaning plants and washeries), whether or not such plants are operated in conjunction with mine sites.
- **SIC Code 14 - Non-Metal Mining.** SIC code 14 includes establishments concerned with mining or quarrying, developing mines or exploring for non-metallic minerals, except fuels. This major group also includes establishments engaged in crushing, grinding, washing, or other concentration activities.
- **SIC Code 40 - Railroad Transportation.** SIC code 40 comprises establishments furnishing transportation by line-haul railroads (SIC code 4011) and railroad terminals (SIC code 4013).
- **SIC Code 42 - Motor Freight Transportation and Warehousing.** SIC code 42 includes establishments engaged in trucking and courier services, except air, or "self-serve" facilities; public warehousing and storage; and terminal and joint terminal facilities for motor freight transportation, or "for-hire" facilities.
- **SIC Code 45 - Air Transportation.** SIC code 45 includes establishments consisting primarily of airlines, air couriers, and airports. This SIC code includes establishments primarily engaged in providing domestic and foreign transportation by air and also those operating airports and flying fields and furnishing terminal services directly related to aviation.
- **SIC Code 46 - Pipelines, except Natural Gas.** SIC code 46 includes establishments primarily engaged in the pipeline transportation of petroleum and other chemicals, except natural gas.

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<sup>11</sup> "Establishment" is the term used by the Census and is not necessarily the same as the definition of "facility" used in this report. Substantial differences in the two definitions are noted throughout the report.

- **SIC Code 47 - Transportation Services.** Establishments in SIC code 47 furnish services incidental to transportation, such as forwarding and packing services, and the arrangements of passenger freight transportation.
- **SIC Code 49 - Electric, Sanitary, and Gas Services.** SIC code 49 includes establishments engaged in the generation, transmission, and distribution of electricity, gas, or steam; natural gas transmission and distribution; combination utilities; water and wastewater treatment facilities; refuse systems; other sanitary systems; steam and air-conditioning supply; and irrigation systems.
- **SIC Code 50/51 - Wholesale Trade.** SIC codes 50 and 51 encompass the wholesale trade of durable goods (SIC code 50) and nondurable goods (SIC code 51).
- **SIC Code 7389 - Solvent Recyclers.** SIC code 7389 includes various services, but this analysis is limited to establishments engaged in solvent recycling.

## 1.7 REGULATORY OPTIONS CONSIDERED IN THIS REPORT

The analysis presented in this report considered several variations of possible reporting for the industries under consideration, including the proposed option. Estimates of the number of affected facilities and the number of expected Form R reports (representing a submission by a facility for a single listed TRI toxic chemical or chemical category) were developed for each industry group under consideration applying the current TRI exemptions and interpretations. For certain activities, alternate interpretations were considered, as in the case of extraction of natural resources containing toxic chemicals in SIC codes 10, 12, and 14 (metal, coal, and non-metal mining, respectively). These options are described in detail in Chapter 2.

In addition, the analysis examined the incremental effect of the change in guidance relating to "otherwise use." The effect of the change in guidance is presented separately for each industry. The analysis also provides separate estimates of the proposed option, which is limited to a subset of the industry groups considered in this analysis. The proposed option, described in chapter 2, also includes the change in guidance related to "otherwise use."

## 1.8 ORGANIZATION OF THIS REPORT

This report examines the potential increase in reporting that would result from expanding the TRI program to 13 additional non-manufacturing industries (i.e., 13 additional SIC codes). This report also estimates the costs to industry and EPA associated with the reporting burden. The remainder of this report is organized as follows:

- **Chapter 2** briefly describes each industry and the activities and associated TRI chemicals that may require reporting. The chapter also presents the estimated number of

affected facilities<sup>12</sup> and number of reports to be filed for each proposed industry group and explains how the estimates were developed. The chapter identifies the key limitations of the analysis which may affect the accuracy of the estimates.

- **Chapter 3** presents the methodology used to estimate the costs and the results of the analysis in terms of total costs to industry and total costs to EPA.
- **Chapter 4** examines the relative economic impacts on "small" entities as required by the Regulatory Flexibility Act of 1980.
- **Chapter 5** analyzes the sensitivity of the estimates to the assumptions used throughout the report.
- **Chapter 6** evaluates the benefits of adding industries to TRI.
- **Chapter 7** explores the environmental justice impacts of adding industries to TRI.
- **Chapter 8** investigates alternative means of constructing toxic release data.
- **Appendices.** This report contains appendices related to substantive portions of the analysis. There are appendices describing in detail the analysis performed to develop estimates of the number of affected facilities and chemical reports for each industry. There are also appendices that provide information common to multiple industries, such as describing the TRI constituents of petroleum products and the databases used in the analysis.

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<sup>12</sup> An affected facility is defined for purposes of this report as a facility: (1) with 10 or more employees; (2) that is included in an SIC code under consideration for TRI reporting; and (3) that manufactures, processes, or otherwise uses at least one toxic chemical above the appropriate threshold quantity. In other words, an affected facility is one estimated to prepare and submit at least one TRI chemical report. The number of facilities potentially subject to the reporting requirements and expected to at least perform a compliance determination to resolve whether submission of chemical reports is required is also estimated in this report.

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## CHAPTER 2

### ESTIMATES FOR NUMBER OF AFFECTED FACILITIES AND NUMBER OF REPORTS

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This chapter provides a summary of the estimated number of affected facilities within each SIC code and the estimated number of reports these facilities are expected to file under the proposed expansion of the TRI program.<sup>1</sup> These estimates are used to calculate both the costs to the regulated community and EPA (see Chapter 3) and to evaluate the impact on small entities (see Chapter 4). More detailed explanation of the data sources, methodologies, and calculations used to generate these estimates are provided in Appendices C through L.

Section 2.0 of this chapter provides an overview of the industries analyzed in this report. Sections 2.1 describes the general methodology used in the analysis. Sections 2.2 through 2.11 summarizes the activities and TRI chemicals associated with each industry group and presents estimates of the number of facilities expected to submit chemicals reports and the total number of reports for each SIC code at the four-digit level or activity level. Section 2.12 summarizes the estimated number for the Proposed Option and the other options considered in this analysis including the Revised Guidance on Otherwise Use. These estimates are generally presented at the two-digit level.

#### 2.0 OVERVIEW OF INDUSTRIES

The industries examined in this report are:

- SIC Code 10 - Metal Mining
- SIC Code 12 - Coal Mining
- SIC Code 14 - Non-Metal Mining
- SIC Code 40 - Railroad Transportation
- SIC Code 42 - Motor Freight Transportation and Warehousing
- SIC Code 45 - Air Transportation
- SIC Code 46 - Pipelines, except Natural Gas
- SIC Code 47 - Transportation Services
- SIC Code 49 - Electric, Sanitary, and Gas Services
- SIC Code 50/51 - Wholesale Trade
- SIC Code 7389 - Solvent Recyclers

#### 2.1 GENERAL METHODOLOGY

Estimates of the number of potentially affected facilities and number of reports were developed for each industry group and are presented in this chapter. The regulatory alternatives under

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<sup>1</sup> The term "affected facilities" is used in this report to denote facilities that meet the TRI reporting requirements and are estimated to submit at least one report for a TRI chemical. Additional facilities in an SIC code may be required to perform compliance determination or rule familiarization activities if their industry group is subject to TRI reporting. A chemical report is a completed Form R report for a single chemical. Facilities may submit more than one Form R if they manufacture, process, or use more than one listed TRI toxic chemical. The number of facilities performing compliance activities, and their attendant costs, are estimated in Chapter 3.

consideration by EPA constitute various combinations of industry groups and other changes in reporting requirements and are summarized in section 2.1.3. Each regulatory alternative is not separately presented in this chapter, but the costs of each is presented in Chapter 3.

### 2.1.1 OVERVIEW OF THE METHODOLOGY

A separate analysis was performed for each industry group under consideration, as explained in detail in the appendices to this report. For certain industry groups, the analysis was conducted at the four-digit SIC code level because the activities performed and chemicals manufactured, processed, and otherwise used varied significantly across different types of firms within a two-digit SIC code. For example, SIC code 49 includes a broad range of utilities including electricity generation, waste disposal, public drinking supplies, and sewage treatment and disposal. Given the gross differences in these activities, a separate methodology and different data sources were used for each.

For other SIC codes, such as mining (SIC codes 10, 12, and 14), the analysis was organized at the four-digit level but a common methodology and data source were largely used for all segments of the mining industry; in this case, a comprehensive data base of chemicals used in mining operations.

For a few SIC codes, the analysis was not organized according to the four-digit SIC codes because either the activities performed involving the manufacture, processing, or otherwise use of TRI chemicals were similar across all four-digit SIC codes or because the most appropriate data source for generating estimates did not provide sufficiently detailed SIC code information. For example, the analysis for SIC code 45 (air transportation) was based on several data sources that were not well matched to the four-digit level organization of the U.S. Census.

Although the methodology and data sources varied from SIC code to SIC code, all of the estimates use as a starting point the same current definitions, exemptions, and interpretations of the TRI program as the basis for estimating the extent of reporting. In circumstances where these definitions, exemptions, and interpretations could not be applied in a straightforward way (e.g., definition of facility for pipelines), alternative definitions and interpretations were developed based on the principles underlying the current program and are noted in the text of the relevant appendix.

To develop the burden estimates for each SIC code, EPA first determined what activities associated with each industry group involve TRI toxic chemicals. EPA then determined whether toxic chemicals associated with these activities met the definition of manufacture, process, or otherwise use and estimated the quantities of each TRI chemical manufactured, processed, or otherwise used by different size facilities within the SIC code. Based on these calculations, the number of facilities likely to report and the number of chemicals for which they are expected to report were estimated.

According to EPCRA section 313(g)(2), facilities are not required to monitor or measure the quantities, concentrations, or frequency of any toxic chemical released into the environment. However, facilities are required to use readily available data (including mandatory data collected under other laws or regulations). Where such data are not readily available, facilities may use reasonable estimates of the amounts involved. This analysis maintained the current program standard that facilities not be required to perform any additional monitoring.

### 2.1.2 OPTIONS CONSIDERED IN THE ANALYSIS

This analysis examined several different options for reporting for facilities in the industries under consideration. In addition, the analysis examined the effects of modifying the interpretation of otherwise use.<sup>2</sup> The options differ largely in the number of industries included for TRI reporting, the extent to which all or only some facilities within an industry group are included, the treatment of extraction of ore or coal for purposes of threshold determination, and the definition of otherwise use. Each of these is discussed below.

Treatment of Extraction of Ore and Coal. The current TRI program has not addressed whether and how facilities should report on TRI chemicals extracted from the ground as natural resources, such as in coal or ore. This issue affects SIC codes 10 and 14 (metal and non-metal mining) and SIC code 12 (coal mining). Extraction could be considered comparable to manufacture, which has implications for the treatment of TRI chemicals found below *de minimis* levels in the material being extracted or mined. Chemicals that are manufactured must be reported regardless of concentration level.

Alternatively, extraction could be considered distinct from either manufacture or processing. TRI chemicals may be extracted during natural resource recovery which are not the primary product sought and have little or no commercial value. In some cases these chemicals may be removed at the extracting facility but in other cases, the removal (i.e., refining, treatment, beneficiation) occurs at a separate facility, which would, under current definitions, represent the TRI constituents of the ore being "distributed in commerce." Since these chemicals are merely commingled with the desired primary product and have no commercial value, it may not be appropriate to consider these chemicals as comparable to being processed. To address how facilities should report on TRI chemicals extracted as natural resources, EPA examined three options:

- **Option 1** – "Process" threshold determinations for those chemicals being extracted or mined are required only for the primary product distributed in commerce. Other constituents that are commingled with the primary product and distributed in commerce would be exempt as an EPCRA section 313 "process" activity and would not be reportable as "manufactured" or "used." Impurities that are removed from the ore before it is distributed in commerce would not be considered to be "manufactured," "processed," or "used."
- **Option 2** – "Process" threshold determinations for those chemicals being extracted or mined are required for the primary product distributed in commerce and for other constituents, present above *de minimis* concentrations that are commingled with the primary product and distributed in commerce. Impurities that are removed from the ore before it is distributed in commerce would not be considered to be "manufactured," "processed," or "used."
- **Option 3** – "Manufacture" threshold determinations for those chemicals being extracted or mined are required for the primary product distributed in commerce and for other constituents, present in any concentration (i.e., the *de minimis* exemption does not apply), that are commingled with the primary product and distributed in commerce.

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<sup>2</sup> As noted above, EPA is considering several regulatory alternatives, each consisting of one or more of the options presented in this analysis and applied to a specified set of the industries considered in this analysis.

Impurities that are removed from the ore before it is distributed in commerce would be considered to be exempt as an EPCRA section 313 "manufacture" activity.

These options reflect the range of possible treatment of reporting for TRI chemicals extracted as natural resources, ranging from requiring reporting only for the primary product or products of commercial value to requiring reporting of all TRI chemicals extracted and subsequently distributed in commerce in quantities greater than the 25,000-pound threshold. The first two options treat extraction as a form of "processing"; the third option treats extraction as a form of manufacturing. In addition, under each of these options, TRI chemicals used in processing the materials extracted or mined or otherwise used at the facility must also be considered for reporting.

Revised Guidance on Otherwise Use<sup>3</sup>. Certain facilities in the industries examined in this analysis receive wastes that include TRI chemicals for ultimate disposal or for treatment. These wastes, and their TRI constituents, may not be manufactured, processed, or otherwise used according to existing TRI definitions but are introduced to the facility as a business activity and therefore may warrant reporting for public right-to-know purposes. To account for this possibility, EPA examined one additional option:

- **Treatment for Destruction, Stabilization/Solidification, Disposal.** This option is called the Revised Guidance on Otherwise Use in this report. Under this option, a facility would be required to report as "otherwise" use TRI chemicals that are treated for destruction, stabilized/solidified, or disposed when the facility engaged in these activities receives materials containing any chemical from one or more other facilities for purposes of treatment for destruction, stabilization/solidification, or disposal. TRI chemicals that: (1) are manufactured during any of these activities below the "manufacturing" threshold but in quantities greater than 10,000 pounds; and (2) are subsequently treated for destruction, stabilized or disposed would be considered "otherwise used." Treatment for destruction would include incineration/thermal treatment (M50 waste code), incineration/insignificant fuel value (M54). Disposal would include underground injection (M71), landfill/disposal surface impoundment (M72), land treatment (M73), and other land disposal (M79). This option would also include solidification/stabilization (M40), some wastewater treatment (M61), and other waste treatment (M69). This option purposely excludes publicly-owned treatment works (POTWs). This option is estimated to affect SIC codes 20-39, 42, 49, and 7389.

This option is in addition to reporting of TRI chemicals based on the existing definitions of manufacture, processing, and otherwise use, and the burden associated with either option is incremental to the estimates generated for the base case, which uses the current definitions. For example, any waste containing a TRI chemical which enters a facility and is chemically treated to recover the TRI chemical, which in turn is resold would be reported under the base case (i.e., TRI chemical is being processed) and not under the Revised Guidance on Otherwise Use Option.

Note that the Options 1, 2, and 3 related to the treatment of extraction as a reporting activity address a separate issue than reporting of TRI-chemical-containing wastes, so the options are additive;

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<sup>3</sup> This option is the same as the proposed change to the interpretative guidance on otherwise use described in the Notice of Proposed Rulemaking (NPRM). The alternative interpretation described in the NPRM is not estimated in this report.

that is, the burden associated with the Revised Guidance on Otherwise Use is independent of the choice for treating extraction.

In addition, the analysis of SIC code 49 examined two cases for the treatment of TRI chemical constituents in fuels burned at these facilities. Case 1 maintains the current *de minimis* exemption for constituents of fuels used at these facilities. Case 2 does not apply the *de minimis* exemption for TRI constituents of fuel and thus generates higher estimates of the number of TRI reports submitted. These two cases are considered only for fuels burned at facilities in SIC code 49.

Proposed Option. The Proposed Option combines several of the options described above and applies them to select industry groups, facilities within industry groups, and activities at facilities within industry groups. The Proposed Option requires TRI reporting as follows:

- **SIC code 10 (Metal Mining).** Facilities is SIC code 10 are required to report except those facilities in SIC code 1081, Metal Mining Services. Threshold determination for chemicals being extracted or mined are required as specified in Option 2.
- **SIC code 12 (Coal Mining).** Facilities is SIC code 12 are required to report except those facilities in SIC code 1241, Coal Mining Services. In addition, coal extraction activities are exempt from all section 313 reporting requirements including reporting of releases and other waste management information associated with extraction activities only.
- **SIC code 4911 (Electric Services), 4931 (Electric and Other Services Combined), and 4939 (Combination Utilities, not elsewhere classified).** Coal or oil-fired (in any percent) electric utility plants in SIC code 49 are required to report under Case 1 described above (i.e., *de minimis* levels apply to TRI constituents of fuels).
- **SIC code 4953 (Refuse Systems).** Commercial hazardous waste treatment facilities in SIC code 4953 that are regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA), including both permitted and Interim Status facilities, are required to report.
- **SIC code 5169 (Wholesale Nondurable Goods - Chemicals and Allied Products, not elsewhere classified).** Facilities in SIC code 5169 are required to report if they manufacture, process, or otherwise use TRI toxic chemicals above threshold quantities.
- **SIC code 5171 (Petroleum Bulk Stations and Terminals).** Facilities in SIC code 5171 are required to report if they manufacture, process, or otherwise use TRI toxic chemicals above threshold quantities.
- **SIC code 7389 (Business Services, not elsewhere classified).** Facilities in SIC code 7389 that primarily engage in solvent recovery activities are required to report if they manufacture, process, or otherwise use TRI toxic chemicals above threshold quantities.

In addition, the Proposed Option includes the Revised Guidance on Otherwise Use, which may affect several of the industries being proposed, as well as facilities in the manufacturing sector already subject to the TRI reporting requirements.

### 2.1.3 REGULATORY ALTERNATIVES

EPA considered eight regulatory alternatives in addition to the Proposed Option. Each of these regulatory alternatives represents a combination of Options 1, 2, and 3, the Revised Guidance on Otherwise Use, and on the Proposed Option applied to certain SIC codes or industry groups. Table 2-1 summarizes each regulatory alternative.

**TABLE 2-1**  
**REGULATORY ALTERNATIVES CONSIDERED**

<b>Regulatory Alternative and Industry Coverage</b>	<b>Industries or Activities</b>	<b>Otherwise Use</b>
I.A Comprehensive Industry Coverage	SICs 10, 12, 14, 40, 42, 45, 46, 47, 49, 50, 51 and part of 7389(Solvent Recovery Services)	Current guidance
I.B Comprehensive Industry Coverage	Same industries as Regulatory Alternative I.A	Revised guidance
II.A Limited Industry Coverage	SICs 10,12, 4911, 4931, 4939, part of 4953 (RCRA subtitle C TSDFs <sup>1</sup> ) , 5169, 5171, and part of 7389 ( Solvent Recovery Services))	Current guidance
II.B Limited Industry Coverage	Same industries as Regulatory Alternative II.A	Revised guidance
III.A Modified Limited Industry Coverage - Proposed Industries	SIC 10 (except mining services), 12 (except extraction and mining services), parts of 4911, 4931, and 4939 (coal and oil fired electric utilities), part of 4953 (RCRA subtitle C TSDFs <sup>1</sup> ), 5169, 5171, and part of 7389 (Solvent Recovery Services)	Current guidance
III.B Modified Limited Industry Coverage - Proposed Industries	Same industries as Regulatory Alternative III.A	Revised guidance
IV.A Comprehensive Industry Coverage, Limited Mining Reporting	Same industries as Regulatory Alternative I.A, but limiting reporting of chemicals processed in mining industry to the primary product of the facility.	Current guidance
IV.B Comprehensive Industry Coverage, Expanded Mining Reporting	Same industries as Regulatory Alternative I.A, but without applying de minimis limitation to mining industries.	Current guidance
V. Comprehensive Industry Coverage, Expanded Electric Utility Reporting	Same industries as Regulatory Alternative I.A, but without applying de minimis limitation to fuels used at electric utilities.	Current guidance

<sup>1</sup>TSDFs=Treatment, Storage, and Disposal Facilities.

Estimates of the costs associated with each regulatory alternative are presented in Chapter 4. Estimates of the number of affected facilities and expected reports are not separately presented in this chapter.

## **2.2 SIC CODE 10 — METAL MINING**

### **2.2.1 DESCRIPTION OF THE SIC CODE**

SIC code 10 includes establishments primarily concerned with mining, developing mines, or exploring for metallic minerals. This SIC code includes all ore dressing and beneficiation processes including mills which crush, grind, wash, leach, and perform gravity flotation operations. Smelters and refineries are not included in this SIC code. SIC code 10 includes the following industries:

- 1011 — Iron Ores
- 1021 — Copper Ores
- 1031 — Lead and Zinc Ores
- 1041 — Gold Ores
- 1044 — Silver Ores
- 1061 — Ferroalloys, Except Vanadium
- 1081 — Metal Mining Services
- 1094 — Uranium-Radium-Vanadium Ores
- 1099 — Miscellaneous Metal Ores, not elsewhere classified

There are 404 facilities in SIC code 10 with 10 or more employees.

### **2.2.2 PRINCIPAL ACTIVITIES**

Facilities in this SIC code conduct the following types of activities involving TRI chemicals:

- Extraction (e.g., open pit; underground mining)
- Beneficiation (e.g., in-situ leaching; magnetic separation; flotation; gravity concentration; electrowinning; cyanidation; precipitation; leaching; solvent extraction).

### **2.2.3 TRI CHEMICALS**

TRI chemicals are manufactured, processed, or used in SIC code 10 as:

- TRI constituents of the ore: copper, arsenic, asbestos, cobalt, lead, selenium, silver, zinc, cadmium, mercury, chromium, manganese, nickel, vanadium, aluminum, and beryllium; and
- Chemicals otherwise used in extraction and beneficiation of the ore: cyanide compounds, hydrochloric acid, sulfuric acid, phosphoric acid, nitric acid, copper sulfate, zinc sulfate, mercury, methanol, chlorine, lead nitrate, and aluminum.

## 2.2.4 RESULTS OF THE ANALYSIS

To estimate the number of reports to be submitted by facilities in SIC code 10, EPA first examined the chemical constituents of ore (i.e., TRI chemicals manufactured or processed during the extraction of the ore) and estimated the number of reports for TRI constituents of ore under each of the three options addressing extraction. EPA then estimated the number of TRI chemicals manufactured or otherwise used during the processing of the ore based on a broad-based government database on chemicals present in the mining sector. SIC code 1081, metallic mining services, except fuels, has no reporting facilities because all activities involving TRI chemicals resulting from mining service companies are assumed to occur at a mine site and to be reported by the owner of the mine and not by the contractor working at the mine site.<sup>4</sup> Table 2-2 presents the results under all three options.

Constituents of Ore. Information on the constituents of ores, their naturally occurring concentrations in ore, and mine throughputs were obtained through phone interviews with private industry representatives and from literature sources. The typical concentration of each TRI constituent present in ore was multiplied by total annual mine throughput to determine if that chemical exceeded the 25,000-pound manufacture or process reporting threshold. In SIC code 1011 (Iron Ore), no facilities report under Option 1, because the primary product being mined (i.e., iron ore) is not a TRI chemical and is therefore not reportable under this Option. Under Options 2 and 3, 23 SIC code 1011 facilities are estimated to report for 23 and 230 TRI chemical constituents of extracted ore, respectively, reflecting the different definitions and interpretations under the options.

Otherwise Use of Chemicals. The National Institute of Occupational Safety and Health's (NIOSH) National Occupational Health Survey of Mining (NOHS-M)<sup>5</sup> was used to estimate the total number of facilities and number of reports generated from the processing of ore (i.e., chemicals otherwise used). For example, in SIC code 1011 (Iron Ore), an additional eight reports are expected for TRI chemicals that are not constituents of ore. The estimates for chemicals otherwise used at mines does not vary by option because the options address the treatment of TRI chemicals present in extracted natural resources only.

The number of reports for TRI constituents of the extracted ore and the number of reports for chemicals otherwise used during the processing of the ore are added together, eliminating any chemical common to both estimates, to provide the total number of TRI reports estimated for the metal mining industry. The number of reports is not additive since those facilities with the largest throughput (i.e., those most likely to report for TRI constituents of ore above threshold levels) are also the facilities most likely to otherwise use in excess of 10,000 of other TRI chemicals. Consequently, the total number of facilities estimated to report is the larger of the estimates generated by each part of the analysis.

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<sup>4</sup> Facilities in SIC code 1081 are specifically not required to report under the Proposed Option.

<sup>5</sup> See Appendices C and O for a more detailed description of the data base.

TABLE 2-2

## ESTIMATED TRI REPORTING BY SIC CODE 10 (METAL MINING INDUSTRY)

SIC Code	Number of Facilities Reporting	Option 1 Reports	Option 2 Reports	Option 3 Reports	Proposed Option
1000	21	43	69	158	69
1011	23 <sup>a</sup>	8	31	261	31
1021	33	113	212	377	212
1031	25	38	113	213	113
1040	3	6	13	23	13
1041	131 <sup>a</sup>	254	516	1,040	516
1044	15	34	64	109	64
1061	11	14	14	36	14
1081	0	0	0	0	0
1090	1	4	4	7	4
1094	37	74	74	148	74
1099	28	66	66	150	66
<b>Totals</b>	<b>328<sup>a</sup></b>	<b>654</b>	<b>1,176</b>	<b>2,522</b>	<b>1,176</b>

<sup>a</sup> For SIC codes 1011 and 1041, because the primary product is not reportable, the number of facilities reporting for Option 1 is only 206, corresponding to facilities otherwise using TRI chemicals. For Options 2, 3, and the Proposed Option, the number of facilities is 328, based on reporting for both TRI constituents of ore and TRI chemicals otherwise used. For all other SIC codes, the number of reporting facilities is as presented in the table under all three options.

### 2.2.5 LIMITATIONS OF THE ANALYSIS

The major limitation of this analysis was the limited data available on ore composition, especially trace constituents, and annual mine throughput. Data were obtained from phone interviews with industry representatives and literature sources and are believed to be reliable but may not be complete or representative across mines. In most four-digit SIC codes, only one or two data sources on ore composition were obtained, and these may be incomplete. In addition, data on total mine production of ore are not widely available. Because both ore composition and throughput will vary greatly from mine to mine, this is a source of uncertainty in the estimates.

## 2.3 SIC CODE 12 — COAL MINING

### 2.3.1 DESCRIPTION OF SIC CODE

SIC code 12 includes 1,874 establishments with 10 or more employees primarily concerned with extracting and beneficiating bituminous coal, anthracite, and lignite. This SIC code includes mining operations and preparation plants (also known as cleaning plants and washeries). Some coal preparation plants operate in conjunction with mine sites and are located on the same property; other preparation plants are stand alone facilities. This major group is comprised of the following four-digit SIC codes:

- 1221 — Bituminous Coal and Lignite Surface Mining
- 1222 — Bituminous Coal Underground Mining
- 1231 — Anthracite Mining
- 1241 — Coal Mining Services

The Proposed Option includes SIC code 12 but exempts coal extraction activities, including reporting of releases and other waste management information associated with extraction activities only. In addition, under the Proposed Option, facilities in SIC code 1241, Coal Mining Services are not required to report.

### 2.3.2 PRINCIPAL ACTIVITIES

Facilities included in SIC code 12 may manufacture, process, or otherwise use TRI chemicals when blasting and extracting raw materials (i.e., toxic chemical impurities), and performing preparation activities (includes cleaning to reduce ash and sulfur content, washing, crushing, screening, and loading).

### 2.3.3 TRI CHEMICALS

The following chemicals are likely to be manufactured, processed, or otherwise used in SIC code 12:

- Metals and minerals present in the ore during extraction, including antimony, arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc;
- Phenanthrene (present in fuel oil used in blasting operations and flotation); and
- Chemicals used during coal preparation processes, including tetrachloroethylene, 1,1,1-trichloroethane, phenanthrene, dichlorodifluoromethane, xylene, ethylene glycol)

### 2.3.4 RESULTS OF THE ANALYSIS

Separate estimates were developed for: (1) TRI chemicals that are commonly found in coal (inorganic constituents); and (2) TRI chemicals that are subsequently used during the coal preparation process (during beneficiation).

Constituents of Coal. The chemical composition of coal varies regionally; therefore, EPA estimated the number of reports based on a range (low, mid, and high cases) of concentrations of inorganic TRI chemicals that are commonly found in coal. The number of TRI reports expected for constituents of coal also varies by extraction option. Because all inorganic TRI chemical constituents of coal are present in below *de minimis* quantities, no mines are estimated to report for TRI constituents under Options 1 and 2. Under Option 3, the number of reports is estimated to be 1,216 (low), 9,384 (mid), and 11,462 (high), respectively, based on different typical values for the concentration of constituents of coal (note: the number of affected mines varies by case as well). No reports are estimated for constituents of coal under the Proposed Option because of this option's exemption for coal extraction activities.

Coal Preparation. TRI chemical use at coal preparation facilities varies depending on facility size, throughput, and location. Most coal preparation facilities in SIC code 12 are expected to use the following TRI chemicals in amounts greater than the 10,000-pound threshold: ethylene glycol, tetrachloroethylene, dichlorodifluoromethane, 1,1,1-trichloroethane, xylene, and phenanthrene. Each of the 321 coal preparation plants identified through analyzing the 1992 Mine Safety and Health Administration (MSHA) production data would be expected to report on the above six chemicals.

Under Options 1 and 2, only coal preparation plants are estimated to report for chemicals otherwise used because no TRI chemical constituents in coal are present above *de minimis* levels. A total of 321 coal preparation plants are estimated to submit 642 chemical reports, as presented below in Table 2-3. (The number of chemicals estimated to be otherwise used at mines is the same for all three options, which only address the treatment of TRI constituents in extracted ore.) Mining service companies are not expected to report separately.

Under Option 3 (all impurities above threshold would be reportable), both mines and preparation plants -- a total of 1,749 facilities that meet the full-time employee threshold -- are expected to report a total of 9,984 reports.

Under the Proposed Option, only the chemicals otherwise used at coal preparation plants are estimated to be reported. A total of 642 reports are expected from 321 facilities.

As explained in Appendix D, acid mine drainage is not reportable; accordingly no reports are estimated for TRI constituents of such drainage.

TABLE 2-3

## ESTIMATED TRI REPORTING FOR SIC CODE 12

	Estimated Number of Facilities (with 10 or more employees)	OPTIONS 1, 2, AND THE PROPOSED OPTION			OPTION 3		
		Estimated Number of Facilities Expected to Report	Estimated Reports per Facility	Estimated Total Number of Reports	Estimated Number of Facilities Expected to Report	Estimated Reports per Facility	Estimated Total Number of Reports
Coal Mines	1,428	0	0	0	1,428	6	8,568 <sup>a</sup>
Co-located Mines/ Preparation Plants	129	129	2	258	129	8	1,032
Preparation Plants	192	192	2	384	192	2	384
Mining Services	125	0	0	0	0	0	0
<b>TOTAL</b>	<b>1,874</b>	<b>321</b>	<b>-</b>	<b>642</b>	<b>1,749</b>	<b>--</b>	<b>9,984</b>

<sup>a</sup> Estimated total number of reports is based on estimates using mid-case concentrations, adjusted for differing estimates of the number of coal mines (See Appendix D).

### 2.3.5 LIMITATIONS OF THE ANALYSIS

There are two sources of uncertainty relating to the analysis of SIC code 12: (1) regional variations in the makeup of coal; and (2) a lack of information on the organic constituents of coal. Regional variations in TRI chemical concentrations naturally occurring in coal would affect the number of reports expected for each facility. EPA examined the ranges of constituent concentrations and estimated the number of reports based on mid-range constituent concentration values for each of the inorganics present in coal. In addition, data on the organic constituents of coal are not available. Coal molecules contain a number of small aromatic nuclei or clusters, and no data source was located that identified concentration values for specific organic chemicals that are TRI chemicals.

## 2.4 SIC CODE 14 — NONMETAL MINING

### 2.4.1 DESCRIPTION OF THE SIC CODE

SIC code 14 includes establishments concerned with mining or quarrying, developing mines or exploring for non-metallic minerals, except fuels. This major group also includes establishments engaged in crushing, grinding, washing, or other concentration activities. SIC code 14 includes the following industries:

- 1411 — Dimension Stone
- 1422 — Crushed and Broken Limestone
- 1423 — Crushed and Broken Granite
- 1429 — Crushed and Broken Stone, not elsewhere classified
- 1442 — Construction Sand and Gravel
- 1446 — Industrial Sand
- 1455 — Kaolin and Ball Clay
- 1459 — Clay, Ceramic, and Refractory Minerals, not elsewhere classified
- 1474 — Potash, Soda, and Borate Minerals
- 1475 — Phosphate Rock
- 1479 — Chemical and Fertilizer Mineral Mining, not elsewhere classified
- 1481 — Nonmetallic Minerals Services, Except Fuels
- 1499 — Miscellaneous Nonmetallic Minerals, Except Fuels

There are 2,510 facilities in SIC code 14 with 10 or more employees.

This SIC code is not included in the Proposed Option.

### 2.4.2 PRINCIPAL ACTIVITIES

Nonmetal mining facilities conduct the following types of activities involving TRI chemicals:

- Extraction (e.g., open pit; stripping; dry/wet pit; blunging; draglines)
- Beneficiation (e.g., wet beneficiation; dry beneficiation; flotation; carbonation; leaching; heavy media separation).

### 2.4.3 TRI CHEMICALS

The following types of chemicals are likely to be reported in SIC code 14, all of which are otherwise used in the non-metal mining industry:

- Flotation reagents;
- Carbonation agents;
- Leaching agents; and
- Chemicals used in heavy media separation.

TRI constituents present in the extracted ore are not generally likely to be reported because they are present in such trace quantities that they are unlikely to meet or exceed the reporting threshold under any option.

### 2.4.4. RESULTS OF THE ANALYSIS

To estimate the number of reports for these facilities, EPA first examined the chemical constituents of ore (i.e., TRI chemicals manufactured or processed during the extraction of the ore) and estimated the number of reports for TRI constituents of ore under each of the three options addressing extraction. EPA then estimated the number of TRI chemicals manufactured or otherwise used during the processing of the ore based on a broad-based government database on chemicals present in the mining sector. Three estimates of reporting are provided reflecting the three alternative options for addressing extraction of natural resources.

Constituents of Mineral Ore. Limited information on the constituents of ores, their naturally occurring concentrations in ore, and mine throughputs were obtained through phone interviews with private industry representatives and from literature sources. Based on these data, no reports are estimated for TRI constituents of extracted ore.

Chemicals Otherwise Used. The National Institute of Occupational Safety and Health's (NIOSH) National Occupational Health Survey of Mining (NOHS-M)<sup>6</sup> was used to estimate the total number of facilities and number of reports generated from the processing of minerals (i.e., chemicals otherwise used). The data base was queried for all TRI chemicals used above the 10,000-pound threshold, and the estimates from the survey sample were extrapolated to the entire nation. Because the list of chemicals captured by the survey is quite extensive, the estimate should be reasonably comprehensive. The number of chemicals otherwise used during mineral mining does not vary by option.

For SIC code 14, 427 facilities are estimated to report 508 TRI otherwise used chemicals, as presented in Table 2-4.

### 2.4.5 LIMITATIONS OF THE ANALYSIS

The major limitation of this analysis was the very limited data available on mineral ore composition, especially trace constituents, and annual mine/quarry throughput. In most four-digit SIC codes, only one or two data sources on ore composition were obtained and these may be incomplete.

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<sup>6</sup> See Appendices E and O for a more detailed description of the data base.

In addition, data on total mine or quarry production are not widely available. Since both ore composition and throughput will vary greatly from mine to mine, this is a source of uncertainty in the estimates.

**TABLE 2-4**

**ESTIMATED TRI REPORTING FOR SIC CODE 14 (NONMETAL MINING)**

<b>SIC Code</b>	<b>SIC Description</b>	<b>Total Number of Reporting Facilities</b>	<b>Total Number of Reports for All Three Options<sup>a,b</sup></b>
1400	Unspecified	9	13
1411	Dimension Stone	3	3
1422	Crushed and Broken Limestone	203	203
1423	Crushed and Broken Granite	24	24
1429	Crushed and Broken Stone, not elsewhere classified	7	11
144	Sand and Gravel	138	184
145	Clay, Ceramic, and Refractory Minerals, not elsewhere classified	7	12
1470	Unspecified within SIC code 147	1	2
1474	Potash, Soda, and Borate Minerals	6	11
1475	Phosphate Rock	18	30
1479	Chemical and Fertilizer Mineral Mining, not elsewhere classified	4	8
1481	Nonmetallic Mining Services, except Fuels	0	0
1499	Misc. Nonmetallic Minerals, except Fuels	7	7
	<b>Totals</b>	<b>427</b>	<b>508</b>

<sup>a</sup> SIC code 14 is not included in the Proposed Option, so there are no affected facilities or expected reports.

<sup>b</sup> All of the reports estimated for this SIC code result from the otherwise use of TRI chemicals.

## 2.5 SIC CODES 40 & 47 — RAILROADS AND TRANSPORTATION SERVICES

### 2.5.1 DESCRIPTION OF SIC CODES

EPA conducted similar analyses for both SIC codes 40 and 47 because of the similarity of activities in the two SIC codes. SIC code 40 comprises facilities furnishing transportation by line-haul railroads (SIC code 4011) and railroad terminals (SIC code 4013). Establishments in SIC code 47 furnish services incidental to transportation, such as forwarding and packing services, and the arrangement of passenger and freight transportation.

Several four-digit SIC codes are contained in SIC code 47. SIC code 4724 (travel agencies), 4725 (tour operators), 4729 and 4731 (arrangement of passenger and freight transportation), 4783 (packing and crating), and 4785 (weighing services) are not likely to contain facilities that manufacture, process, or use TRI chemicals of any significant quantity or would be exempt from reporting under the motor vehicle exemption. Only SIC code 4741 (rental of railroad cars) and 4789 (transportation services not elsewhere classified) are estimated to report<sup>7</sup>. The Census estimates a total of 7,830 facilities in SIC code 47 with 10 or more employees. Only a small fraction of those facilities are engaged in transportation services likely to manufacture, process, or otherwise use significant quantities of TRI chemicals.

This SIC code is not included in the Proposed Option.

### 2.5.2 PRINCIPAL ACTIVITIES

Facilities conduct the following activities that are likely to result in the manufacture, process, or otherwise use of TRI chemicals under SIC codes 40 and 47.

- Yard operations (SIC code 40)
- Railroad fueling operations (SIC code 40)
- Rolling stock maintenance (SIC codes 40 and 47)
- Locomotive repair (SIC codes 40 and 47)
- Rail repair operations (SIC codes 40)
- Precooling fruits and vegetables in connection with transportation (SIC code 47)
- Independently operated pipeline terminal operations (SIC code 47)
- Space flight operations (SIC code 47)

### 2.5.3 TRI CHEMICALS

Facilities in SIC codes 40 and 47 will likely be required to file reports for solvents used in painting operations (e.g., methyl ethyl ketone, toluene, xylene, and ethylbenzene) and other solvents used in cleaning operations at some facilities. Those facilities involved in refrigeration may report for chlorofluorocarbons. Phenanthrene in diesel fuel will also be reportable. Other likely TRI chemicals used in this industry include chemicals used in rocket fuels such as hydrazine or nitric acid.

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<sup>7</sup> The TRI regulations currently exempt chemicals used for maintaining motor vehicles operated by the facility. This analysis assumes that if SIC codes 40 and 47 were subject to TRI reporting, the motor vehicle maintenance exemption would not be applicable to locomotives. This interpretation is consistent with the guidance for federal facilities, where otherwise exempted activities are to be reported if they are the principal activity of the facility.

#### 2.5.4 RESULTS OF THE ANALYSIS

**Definition of a Facility.** For the purposes of this analysis, a facility under SIC code 40 and 47 is defined to include places of operations with clearly demarcated boundaries that do not include the tracks connecting "separate" locations. Under this interpretation, multiple locations linked by track owned by a single railroad would report as distinct facilities rather than as a single contiguous entity.

**SIC Code 40: Railroad Transportation.** Yard operations involve welding, minor locomotive repair, and fueling. An estimated 650 railyards are projected to submit three reports per yard for a total of 1,950 reports. Fueling operations are included in yard operations accounting for an estimated number of one report per operation. Rolling stock maintenance facilities include 81 facilities that perform painting and welding operations. One report is projected to be filed per rolling stock maintenance facility. Summing yard operations and rolling stock maintenance facilities yields a total of 731 facilities that would file 2,112 reports.

**SIC Code 47: Railroad Transportation.** One-hundred-forty rolling stock maintenance facilities were estimated to report for painting operations (two reports per facility), welding operations (one report per facility), and refrigeration repair (one report per facility from five facilities) were estimated per operation to yield 425 reports. Two facilities that repair locomotives are estimated to report four reports associated with overhauling locomotives. Precooling fruits and vegetables were estimated to yield five reports from five facilities, and space flight operations were estimated to included three facilities and total of six reports. A total of 155 reporting facilities and 440 reports, therefore, are expected from SIC Code 47.

Total reporting for SIC codes 40 and 47 is presented in Table 2-5.

**TABLE 2-5**

#### **ESTIMATED TRI REPORTING FOR SIC CODES 40 AND 47**

<b>SIC Code</b>	<b>Number of Reporting Facilities</b>	<b>Total Number of Reports</b>
40	731	2,112
47	155	440

#### 2.5.5 LIMITATIONS OF THE ANALYSIS

Although discussions with industry experts suggest great commonality in activities and practices across this industry, the estimates presented in this report are based on a limited number of site visits and conversations with railroad industry representatives. Extrapolating from a small sample always engenders uncertainty, and extrapolating estimates from those sites visited to all facilities may be inappropriate.

## 2.6 SIC CODE 42 — MOTOR FREIGHT TRANSPORTATION AND WAREHOUSING

### 2.6.1 DESCRIPTION OF SIC CODE

The following major industries are included in SIC code 42:

- 421 — Trucking and Courier Services, Except Air, Including: Trucking "Self-Serve" Facilities
- 422 — Public Warehousing and Storage
- 423 — Terminal and Joint Terminal Facilities for Motor Freight Transportation, Including: Trucking "For-Hire" Facilities

Facilities in SIC code 421 are the warehouses and operations centers of large trucking fleets. Facilities in SIC 422 are warehousing storing and handling goods on a fee basis but not associated with a fleet of vehicles (i.e., for-rent storage space). Facilities in SIC code 423 are facilities providing terminal and vehicle maintenance services on a for-hire basis (i.e., not tied to a specific company or fleet). The Census estimates that 28,938 facilities in SIC code 42 have 10 or more employees.

This SIC code is not included in the Proposed Option.

### 2.6.2 PRINCIPAL REPORTABLE ACTIVITIES AND TRI CHEMICALS

Approximately 28,281 facilities in SIC code 42 are estimated to meet the 10 or more FTE threshold, and would need to investigate the manufacture, process, or otherwise use of TRI chemicals at their facilities to make a compliance determination. Under the base reporting case, 26,415 facilities would make an estimated 49,544 reports. Under the Revised Guidance on Otherwise Use, an additional 111 facilities would make an estimated 11,041 additional reports.

#### Self-Serve Trucking Facilities (SIC Code 421)

Three main activities at self-serve trucking facilities result in potential TRI reporting: (1) fueling, involving the use of diesel and/or gasoline constituents; (2) use of vehicle maintenance chemicals;<sup>8</sup> and (3) use of cleaning chemicals/solvents.

First, this analysis estimated the number of self-serve trucking facilities with 10 or more FTEs which provided either primarily gasoline fuel (30 percent, or approximately 7,903 facilities) or diesel fuel (70 percent, or approximately 18,440 facilities). These estimates were combined with data on fuel consumption to calculate fuel consumption per type of vehicle and the number of vehicles per facility to determine the number of facilities exceeding the reporting thresholds for TRI chemicals.

Gasoline Fueling. Facilities providing primarily gasoline fuel are expected to report from one to six gasoline fuel constituents (methyl tert-butyl ether (MTBE), benzene, ethylbenzene, toluene,

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<sup>8</sup> The TRI regulations currently exempt chemicals used for maintaining motor vehicles operated by the facility. This analysis assumes that if SIC code 42 were subject to TRI reporting, the motor vehicle maintenance exemption would not be applicable. This interpretation is consistent with the guidance for federal facilities, where otherwise exempted activities are to be reported if they are the principal activity of the facility.

xylene, n-hexane, and/or cyclohexane), depending on the amount of fuel disbursed annually. As a result, a total of 26,080 reports are expected to be submitted for TRI constituents of gasoline.

**Diesel Fueling.** Facilities primarily dispensing diesel fuel may report on one diesel fuel constituent (phenanthrene), depending on annual fuel consumption. Approximately 1,033 facilities are estimated to report on the diesel constituent.

**Maintenance Chemicals.** Most TRI chemicals used for vehicle maintenance are not expected to result in reporting because either the quantities of chemicals used are below the threshold quantities or because the TRI constituents of these substances are below *de minimis* concentrations. The exception is the use of coolant/antifreeze, which is made up of approximately 50% ethylene glycol, and appears to be used in reportable quantities by most facilities. This analysis estimates that all 18,440 diesel and 7,903 gasoline facilities with 10 or more FTEs would report the otherwise use of ethylene glycol.

**Solvent/Cleaning Chemicals.** "Large" gasoline and diesel facilities, on average, are also expected to report the use of one cleaning agent/solvent for tank truck cleaning operations. "Large" gasoline and diesel facilities were determined to be those having 10 or more mechanics. This cut-off results in an estimate of 2,194 "large" diesel facilities, and 411 "large" gasoline facilities reporting on an average of one cleaning chemical/solvent each. The estimated one chemical report is likely to be one of the following chemicals: methyl ethyl ketone, methyl isobutyl ketone, or xylene.

**Revised Guidance on Otherwise Use and Self-Serve Facilities.** Because no extraction occurs in SIC code 42, the three options related to the treatment of natural resource extraction are not considered. However, facilities in this SIC code clean out tanks and thus may report under the Revised Guidance on Otherwise Use. Under the Revised Guidance on Otherwise Use, "large" gasoline and diesel facilities providing cleaning operations are also expected to report on four TRI chemicals resulting from the wastestreams from transportation equipment cleaning operations. These chemicals could be any of the multitude of TRI chemicals transported by the trucking industry. Reporting on these chemicals results in approximately 10,420 additional reports under the Revised Guidance on Otherwise Use. Reporting for SIC code 4210 is presented in Table 2-6.

**TABLE 2-6**  
**ESTIMATED TRI REPORTING FOR SIC CODE 4210**

SIC CODE	ESTIMATED BASE REPORTING		REVISED GUIDANCE ON OTHERWISE USE	
	Number of Facilities	Total Reports	Number of Additional Facilities	Additional Reports
<b>4210: Self-Serve Trucking</b>	26,343	48,896	0	10,420

## Public Warehouses (SIC Code 422)

This SIC code includes warehouses handling agricultural products, refrigerated goods, general merchandise, and special products including liquids, hazardous substances, and petroleum products. According to section 327 of EPCRA, the statute does not apply to materials being transported or stored incidental to transportation. The exemption relating to storage is limited to the storage of materials that are still moving under active shipping papers and which have not reached the ultimate consignee. This analysis assumes that TRI chemicals stored and handled at public warehouses are under active shipping papers, and thus are not reportable. As a result, no reports are expected from any of the facilities in SIC code 422 except under the Revised Guidance on Otherwise Use, as indicated in Table 2-6 below.

Petroleum Sludge Under the Revised Guidance on Otherwise Use. Facilities in SIC code 4226 (Special Warehousing and Storage) handling bulk petroleum products may periodically clean their tanks, requiring reporting under the Revised Guidance on Otherwise Use. Benzene, chromium, and cadmium appear to be produced in relatively large volumes in the sludge layer that forms at the bottom of tanks storing petroleum, oil, and gasoline. Under the Revised Guidance on Otherwise Use, these TRI sludge constituents would be considered potentially reportable. EPA estimates that all 111 of the bulk petroleum and oil and gasoline storage facilities with 10 or more FTEs (a subset of the SIC code 4226 "special public warehouses" category) would each report on these three chemicals under the Revised Guidance on Otherwise Use, for a total of 333 reports, as indicated in Table 2-7 below.

**TABLE 2-7**

### ESTIMATED TRI REPORTING FOR SIC CODES 4221, 4222, 4225, AND 4226

SIC CODE	ESTIMATED BASE REPORTING		REVISED GUIDANCE ON OTHERWISE USE	
	Number of Facilities	Total Reports	Number of Additional Facilities	Additional Reports
<b>4221: Farm Product Warehousing</b>	0	0	0	0
<b>4222: Refrigerated Warehousing</b>	0	0	0	0
<b>4225: General Warehousing &amp; Storage</b>	0	0	0	0
<b>4226: Special Warehousing &amp; Storage</b>	0	0	111	333

Note: No reporting is expected from facilities in SIC codes 4221, 4222, or 4225 under either the base case of reporting or the Revised Guidance on Otherwise Use because the activities involving TRI-listed chemicals at these warehouses do not fall under the definitions of manufacture, process, otherwise use, or the Revised Guidance on Otherwise Use.

## For-Hire Trucking Facilities (SIC code 423)

This relatively small number of facilities (72 facilities with 10 or more FTEs) is expected to provide all of the services offered by large self-serve trucking facilities, based on the assumption that for-hire trucking facilities would be likely to provide a wide range of services in order to attract

customers and would most likely use large amounts of fuel. Therefore, facilities in this SIC code are expected to report on all of the constituents of gasoline and diesel fuel (MTBE, benzene, ethylbenzene, toluene, xylene, n-hexane, cyclohexane, and phenanthrene), ethylene glycol, and one cleaning agent/solvent, resulting in 648 reports.

Revised Guidance on Otherwise Use and For-Hire Trucking Facilities. Under the Revised Guidance on Otherwise Use, these for-hire facilities are also expected to report on four TRI chemicals resulting from the wastestreams from transportation equipment cleaning operations. These chemicals could be any of the multitude of TRI chemicals transported by the trucking industry. Reporting on these chemicals results in approximately 288 additional reports under the Revised Guidance on Otherwise Use.

Table 2-8 summarizes the reporting expected for SIC code 423.

**TABLE 2-8**

**ESTIMATED TRI REPORTING FOR SIC CODE 423**

SIC CODE	BASE CASE REPORTING		REVISED GUIDANCE ON OTHERWISE USE	
	Number of Facilities	Total Reports	Number of Additional Facilities	Additional Reports
<b>423: For-Hire Trucking</b>	72	648	0	288

Total estimated reporting for SIC code 42 is presented in Table 2-9 for the base case of reporting and for the Revised Guidance on Otherwise Use. Estimates for the Revised Guidance on Otherwise Use are incremental to the estimates for the base case. The Proposed Option does not include SIC code 42, so no reporting for SIC code 42 is estimated for this option.

TABLE 2-9

## ESTIMATED TOTAL TRI REPORTING FOR SIC CODE 42

SIC CODE	BASE CASE REPORTING		REVISED GUIDANCE ON OTHERWISE USE	
	Number of Facilities	Total Reports	Number of Additional Facilities	Additional Reports
4210: Self-Serve Trucking	26,343	48,896	0	10,420
4226: Special Warehousing & Storage	0	0	111	333
4230: For-Hire Trucking	72	648	0	288
<b>TOTAL</b>	<b>26,415</b>	<b>49,544</b>	<b>111</b>	<b>11,041</b>

Note: No reporting is expected from facilities in SIC codes 4221, 4222, or 4225 under either the base case of reporting or the Revised Guidance on Otherwise Use because the activities involving TRI-listed chemicals at these warehouses do not fall under the definitions of manufacture, process, otherwise use, or the Revised Guidance on Otherwise Use.

### 2.6.3 LIMITATIONS OF THE ANALYSIS

Two major limitations to this analysis are: (1) the number of TRI constituents of gasoline and diesel above *de minimis* may vary from refiner to refiner and seasonally; and (2) the estimate of 70 percent of the universe of trucking facilities providing diesel versus 30 percent providing gasoline is an approximation based on professional judgment rather than empirical data. The accuracy of these estimates could not be easily verified.

## 2.7 SIC Code 45 — AIR TRANSPORTATION

### 2.7.1 DESCRIPTION OF SIC CODE

SIC code 45 includes 4,489 establishments with 10 or more employees, consisting primarily of airline facilities at airports, air couriers, and airports themselves. This SIC code includes establishments engaged in providing domestic and foreign air transportation and also those operating airports and flying fields and furnishing terminal services directly related to aviation. This major group is comprised of the following four-digit SIC codes:

- 4512 — Air Transportation, Scheduled
- 4513 — Air Courier Services
- 4522 — Air Transportation, Nonscheduled
- 4581 — Airports, Flying Fields, and Airport Terminal Services

This SIC code is not included in the Proposed Option.

## 2.7.2 PRINCIPAL ACTIVITIES

Facilities included in SIC code 45 may engage in the following activities involving TRI chemicals:

- De/anti-icing of aircraft and ground surfaces; and
- Maintenance, repair, and cleaning of aircraft.

Dispensing and burning of jet fuel is not expected to result in reporting because the TRI constituents of jet fuel are below *de minimis* concentrations.

## 2.7.3 TRI CHEMICALS

Facilities under SIC code 45 are expected to report on the following TRI chemicals: dichloromethane, ethylene glycol, methyl ethyl ketone, sulfuric acid, toluene, 1,1,1-trichloroethane, and trichloroethylene. All of the chemicals are otherwise used in airport operations.

## 2.7.4 RESULTS OF THE ANALYSIS

Based on Census data from 1990, it is estimated that 4,489 facilities in SIC code 45 have 10 or more employees. Facilities in SIC codes 4513, 4522, and 4581 are not expected to report because it is unlikely that activities conducted at these facilities use more than 10,000 pounds of any TRI chemical. Thus, all reports for SIC code 45 are expected from facilities in SIC code 4512, which corresponds to the airport facilities of scheduled airlines.

Definition of Facility. For purposes of this analysis, a facility is defined as the physical space including gate and ramp area controlled by an airline, fixed base operator (i.e., company providing aircraft support services and/or flying lessons), or other leaseholder at an airport. Under this definition, the airport authority would be responsible for areas not under the control of other entities (e.g., taxiways and runways); however, facilities in SIC code 45 operating at the airport would be responsible for reporting the manufacture, processing, or use of chemicals in the areas over which they have control.

Deicing. It is estimated that 951 facilities, approximately one-third of the air transportation facilities that perform transportation equipment cleaning operations (3,068 facilities), would report because they use more than 10,000 pounds annually of ethylene glycol for aircraft de/anti-icing. These facilities are mostly airport facilities of large airlines in cities prone to snow or ice conditions and with a relatively large number of daily flights.

Aircraft Maintenance. Most routine maintenance on commercial aircraft uses small amounts of TRI chemicals, mostly solvents, and are unlikely to exceed the threshold over the course of a year. More complicated maintenance procedures (mandatory airframe and avionics inspections, repainting, cabin refurbishment, engine overhauls) are performed in a few, centralized maintenance centers or at off-site locations (e.g., engines are typically sent back to manufacturer for major overhauls). EPA estimates that the 10 major airlines<sup>9</sup>, on average, have two major maintenance facilities each that would report on six TRI chemicals, and an additional two minor maintenance facilities each that would

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<sup>9</sup> See Appendix H for the distinction between major, national, and regional airlines.

report on one TRI chemical. EPA also estimates that the 12 national airlines have one major maintenance facility each that would report on six TRI chemicals, and an additional two minor maintenance facilities each that would report on one TRI chemical. Smaller airlines typically contract out any maintenance activities that may require use of significant quantities of TRI chemicals.

The expansion of the TRI reporting requirements to SIC code 45 is expected to generate approximately 984 reports from 824 facilities, as shown in Table 2-10. The Revised Guidance on Otherwise Use is not expected to result in additional reports from SIC code 45.

**TABLE 2-10**  
**ESTIMATED TRI REPORTING FOR SIC CODE 45**

<b>SIC Code</b>	<b>Number of Facilities Estimated to Report</b>	<b>Estimated Total Number of Reports</b>
4512	824	984
4513	0	0
4522	0	0
4581	0	0
<b>TOTAL</b>	<b>824</b>	<b>984</b>

#### **2.7.5 LIMITATIONS OF THE ANALYSIS**

There are two key limitations to the analysis for SIC code 45. First, available data on ethylene glycol use were limited and aggregated such that it was necessary to convert airport-level data to annual estimates for individual airlines. Thus, it is difficult to determine if these data accurately represent deicing practices at the airline level across the country. Secondly, the estimates of the number of maintenance bases (i.e., facilities) and number and quantity of chemical use was based on discussions and site visits with a small number of airlines. Although it is believed that practices across the airline industry are quite similar, other airlines may use additional TRI chemicals in reportable quantities.

### **2.8 SIC Code 46 — PIPELINES (except natural gas)**

#### **2.8.1 DESCRIPTION OF SIC CODE**

This SIC code includes establishments primarily engaged in the pipeline transportation of petroleum and other chemicals, except natural gas. This major group is comprised of the following four-digit SIC codes:

- 4612 — Crude Oil Pipelines
- 4613 — Refined Petroleum Pipelines (gasoline pipelines, common carriers and refined petroleum product pipelines)

- 4619 — Pipelines, not elsewhere classified (includes coal pipeline operations, pipeline operations - except petroleum and natural gas, and slurry pipeline operations)

Because many pipelines are used for transporting both crude (SIC code 4612) and product (SIC code 4613), and few of the pipeline miles in the United States are classified under SIC code 4619, the analysis was not performed at the four-digit SIC code level.

This SIC code is not included in the Proposed Option.

## 2.8.2 PRINCIPAL ACTIVITIES

Activities that may manufacture, process, or otherwise use TRI chemicals within SIC code 46 include:

- Addition of chemicals to flowing mediums;
- Maintenance procedures at pumping stations; and
- Pigging operations.

## 2.8.3 TRI CHEMICALS

Facilities in SIC code 46 may add chemicals including kerosene to flowing mediums to reduce drag. The constituents of kerosene include TRI chemicals but the quantity used is not expected to exceed the reporting threshold.

## 2.8.4 RESULTS OF THE ANALYSIS

Definition of Facility. For purposes of this analysis, a facility is defined as a pumping station along the pipeline, not as the entire pipeline.<sup>10</sup> Each pumping station, its grounds, and all equipment would be a separate facility for purposes of TRI reporting, and all activities performed on the portion of the pipeline within the facility's boundary would be reportable for that facility. Transfer stations (marking the end or beginning of pipelines) are assumed to be included under other SIC codes such as 1311 (crude petroleum and natural gas), 2911 (petroleum refining), 5171 (petroleum bulk station and terminals), and 5172 (petroleum products, misc.) Very few pumping stations are estimated to meet the 10 or more employee threshold for TRI reporting.

Results. For SIC code 46, the number of facilities estimated to report is zero. Few facilities are expected to meet the 10 or more FTE threshold for reporting, and the activities at these facilities are not estimated to result in the manufacture, process, or otherwise use of TRI chemicals above threshold amounts under normal operating conditions.

EPCRA Section 327 exempts transportation or storage incidental to transportation from EPCRA Title III reporting. Pipeline contents are assumed to be "in transit" and thus exempt from reporting.

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<sup>10</sup> This definition is consistent with the treatment of network-type operations in other industries, such as railroads and electricity-generating plants and transmission lines.

## 2.8.5 LIMITATIONS OF THE ANALYSIS

The estimate of zero reporting facilities for this SIC code rests on the assumption that few pumping stations will meet the employee threshold for TRI reporting, which is based on estimates of the total number of pumping stations along pipelines in SIC code 46 and total industry employment. These estimates were verified in a limited number of interviews with industry representatives, but do represent industry-wide averages, which may not be true for a small number of facilities. Further, this analysis estimates that regular annual maintenance at pumping stations does not involve use of a threshold quantity of any TRI chemical. Special activities, however, may involve greater quantities and/or additional TRI chemicals, which are not reflected in the analysis because information was not available.

## 2.9 SIC CODE 49 — ELECTRIC, GAS, AND SANITARY SERVICES

### 2.9.1 DESCRIPTION OF SIC CODE

The following major industries are included in SIC code 49:

- 4910 — Electric Utilities
- 4920 — Natural Gas Transmission and Distribution
- 4930 — Combination Utilities
- 494 — Water Treatment Facilities
- 4952 — Wastewater Treatment Facilities
- 4953 — Refuse Systems
- 4959 — Other Sanitary Systems
- 4960 — Steam and Air-Conditioning Supply
- 4970 — Irrigation Systems

Public drinking water and wastewater treatment facilities as well as municipal landfills and combustion units may not always be included in this SIC code by the Census. Instead they may be classified in SIC code 9511 (Air and Water Resource and Solid Waste Management). However, based on the similarity of activities performed at these facilities, this analysis considers these public facilities along with their private counterparts. Public drinking water facilities were considered to be in SIC code 494, public wastewater treatment facilities in SIC code 4952, and municipal landfills and combustion units in SIC code 4953.

In addition, the analysis of SIC code 49 considered two alternatives for base case reporting. Case 1 would treat threshold determinations for constituents of fuel combusted at these facilities in accordance with existing TRI guidance. Case 2 would eliminate the *de minimis* exemption for TRI constituents in fuel, thus requiring reporting for any TRI chemical present in combusted fuel that exceeds the annual threshold.<sup>11</sup>

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<sup>11</sup> Cases 1 and 2 are variations of the base case of TRI reporting considered in this analysis and are entirely distinct from: Options 1, 2, and 3 which address the treatment of extracted natural resources; and the Revised Guidance on Otherwise Use, which addresses wastes handled by a facility but not manufactured, processed, or otherwise use according to current TRI definitions. Cases 1 and 2 are unique to SIC code 49.

The Proposed Option includes coal and oil-fired facilities in SIC codes 4911, 4931, and 4939, and a subset of SIC code 4953 that are commercial hazardous waste treatment facilities that are regulated under RCRA Subtitle C (including both permitted and Interim Status facilities).

## 2.9.2 PRINCIPAL REPORTABLE ACTIVITIES, TRI CHEMICALS, AND ESTIMATED REPORTING

### Electric Utilities and Combination Utilities (SIC codes 4911 and 4930)<sup>12</sup>

For this analysis, utility facilities were distributed by primary fuel type (i.e., coal steam, oil/gas steam, gas turbines, internal combustion turbines, hydroelectric, and nuclear), and ranges of fuel consumption were calculated for fossil fuel-fired steam utilities.<sup>13</sup> This analysis considered 3,110 utilities under SIC code 491 and 456 combination utilities in SIC code 493 eligible for TRI reporting. Electric utilities and combination utilities have three major areas of potential TRI reporting: (1) constituents of fuel; (2) manufactured emissions from fuel combustion at fossil-fuel fired plants; and (3) otherwise use of a variety of maintenance and cleaning chemicals.

Constituents of Fuel. Most utility fuel constituents are below *de minimis* concentrations. One exception is the polycyclic aromatic compounds (PAC) category in No. 6 fuel oil. Based on the relatively high concentration of PAC in fuel oil, all facilities considered to primarily use oil/gas are expected to make one report on this chemical category. In addition, some coal burning facilities would report on chromium, manganese, and nickel depending on their annual fuel consumption. Primary fuel types for combination utilities in SIC code 493 were assumed based on limited information, and estimates regarding typical reporting from the SIC code 491 analysis were then applied to the SIC code 493 facilities.

Manufactured Emissions. All facilities primarily burning oil/gas are expected to manufacture above threshold quantities of sulfuric acid. Facilities primarily burning coal are expected to report on sulfuric acid and hydrochloric acid, and some facilities would also report on hydrofluoric acid and formaldehyde, depending on the facility's annual fuel consumption).

Maintenance/Cleaning Chemicals. Chromium compounds, copper compounds, hydrazine, and zinc compounds may all be used for corrosion control at utilities. Cooling tower water may be treated/demineralized with acids (generally sulfuric acid, but also hydrochloric acid) before it is used at the plant; however, this activity would not be reportable because it does not appear to use above threshold quantities of the *aerosol* forms of these acids. Formic acid and thiourea may be used in boiler cleaning activities or in other kinds of cleaning activities at all types of utility plants, and large volumes of abrasives (which may contain copper and lead compounds) may also be used for cleaning activities. Brominated compounds, ammonia, hydrochloric acid, or chlorine may be used to treat intake water. Finally, other miscellaneous chemicals used at utility plants include ethylene glycol (used in generating station chillers and at some facilities in cold climates to prevent coal from freezing), and xylene and methylene chloride (used as solvents for degreasing activities). Based on the variety of maintenance/cleaning chemicals that may be used above threshold quantities at different

<sup>12</sup> SIC code 493 includes SIC codes 4931, 4932, and 4939 (SIC codes 4931 and 4939 are included in the Proposed Option). SIC code 491 includes SIC code 4911, which is included in the Proposed Option.

<sup>13</sup> Information on fuel consumption was not available for gas and internal combustion turbine facilities or combination utilities, and was not considered relevant for this analysis for hydroelectric or nuclear facilities.

utilities, this analysis assumed that all utilities, regardless of fuel type, would report the otherwise use of any three of the possible maintenance/cleaning chemicals.

Case 1: Applying the *De Minimis* Exemption to Fuel Constituents. As stated earlier, the analysis of SIC code 49 considered two alternatives for base case reporting. These cases contrast the number of affected facilities and number of reports in SIC codes 4911 and 4930 if the current TRI *de minimis* exemption was not applied to fuel constituents. Case 1 treats threshold determinations for constituents of fuel combusted at these facilities in accordance with existing TRI guidance.

Case 2: Not Applying the *De Minimis* Exemption to Fuel Constituents. Case 2 is a scenario that considers eliminating the *de minimis* exemption for constituents of combusted fuel. Under this scenario, more chemicals are subject to reporting by fossil-fuel fired utilities. Facilities primarily using fuel oil are expected to report on from two to eight fuel oil constituent chemicals (benzene, toluene, ethylbenzene, manganese, nickel, xylene and naphthalene), depending on annual estimated fuel consumption. Facilities primarily using coal are expected to report on from four to 13 coal constituent chemicals (beryllium, cadmium, selenium, antimony, arsenic, copper, lead, manganese, nickel, barium, chromium, vanadium fume/dust, and zinc fume/dust), depending on annual estimated fuel consumption.

Table 2-11 summarizes estimated reporting for SIC codes 4911 and 4930 for Cases 1 and 2. Table 2-12 summarizes estimated reporting for SIC codes 4911 and 4930 under the Proposed Option.

**TABLE 2-11**

**ESTIMATED TRI REPORTING FOR SIC CODES 4911 AND 4930: CASES 1 AND 2**

SIC Code	CASE 1		CASE 2	
	Facilities Affected	Total Reports	Facilities Affected	Total Reports
4910: Electric Services	2,475	8,754	2,475	13,546
4930: Combination Utilities	456	2,736	456	4,560

Note: Case 1 retains the *de minimis* exemption for constituents of fuel combusted at these facilities. Case 2 does not apply the *de minimis* exemption.

TABLE 2-12

## ESTIMATED TRI REPORTING FOR SIC CODES 4911 AND 4930: PROPOSED OPTION

SIC Code	PROPOSED OPTION	
	Facilities Affected	Total Reports
4910: Electric Services	514	2,697
4930: Combination Utilities	456	2,786

EPA estimates that no facilities in this SIC code would submit additional reports under the Revised Guidance on Otherwise Use.

#### Natural Gas Transmission and Distribution (SIC code 4920)

Pipeline Compressor Stations. Compressor stations maintain flow in gas pipelines, and are generally substantial installations. The compressors along the gas pipelines in this SIC code are generally powered by combustion of natural gas drawn from the pipeline using reciprocating or turbine engines. Combustion of natural gas in reciprocating or turbine engines can result in the manufacture of formaldehyde above threshold quantities. This analysis assumed that natural gas compressor stations meeting the 10 or more FTE threshold (approximately 20 percent of the national total of 4,296 compressor stations, or 896 facilities) would report on manufactured emissions of formaldehyde.

Mixed, Manufactured, or Liquefied Gas Production and/or Distribution. This analysis found one facility with 10 or more FTEs manufacturing synthetic natural gas from naphtha, and 34 other miscellaneous mixed natural and manufactured gas production and distribution facilities with 10 or more FTEs. All 35 of these facilities are expected to report the otherwise use of ethylene glycol for miscellaneous facility processes. In addition, the single coke oven gas facility in this SIC code is expected to report on 11 chemicals: the use of a single treatment chemical (ammonia), the constituents of coke oven gas (PAC chemical category, ethylene and propylene)<sup>14</sup> and light oil (benzene, ethylbenzene, toluene, and xylene); and three manufactured emissions (hydrofluoric acid, hydrochloric acid (aerosol), and sulfuric acid (aerosol)).

Not Applying the *de minimis* Exemption to Fuel Constituents. Under Case 2, the single coke oven gas plant is expected to report on 14 additional chemicals including coal constituent chemicals (mercury, silver, beryllium, cadmium, selenium, antimony, arsenic, copper, lead, manganese, nickel, barium, chromium, and zinc fume/dust).

Table 2-13 summarizes the estimated reporting for SIC code 4920 under Cases 1 and 2. SIC code 4920 is not included in the Proposed Option; therefore no reports are expected under that option.

<sup>14</sup> Note that the listing of hydrogen sulfide on the TRI has been administratively stayed (i.e., it is listed, but reporting is suspended until a final decision is made whether or not to de-list it). Therefore, additional reports expected as a result of this chemical are not included in the totals for this SIC code.

TABLE 2-13

## ESTIMATED TRI REPORTING FOR SIC CODE 4920: CASES 1 AND 2

SIC Code	CASE 1		CASE 2	
	Facilities Affected	Total Reports	Facilities Affected	Total Reports
4920: Gas Transmission/ Distribution	896	906	896	920

EPA estimates that no facilities in this SIC code would submit additional reports under the Revised Guidance on Otherwise Use.

**Water Treatment Facilities (SIC code 494)**

The 3,310 water treatment facilities treating more than two million gallons a day and serving over 12,500 people are expected meet the 10 or more FTE threshold and to report the otherwise use of chlorine. This estimate is the same for both Cases 1 and 2. In addition, under the Revised Guidance on Otherwise Use, all water treatment facilities with 10 or more FTEs (a total of 3,356 facilities, or 46 additional facilities) are expected to report on one chemical constituent (manganese) of their sludge.

Table 2-14 summarizes the estimated reporting for SIC code 4940 under Cases 1 and 2, in addition to the Revised Guidance on Otherwise Use. SIC code 4940 is not included in the Proposed Option; therefore no reports are expected under that option.

TABLE 2-14

ESTIMATED TRI REPORTING FOR SIC CODE 4940: CASES 1 AND 2,  
AND THE REVISED GUIDANCE ON OTHERWISE USE

SIC Code	CASES 1 AND 2		REVISED GUIDANCE ON OTHERWISE USE	
	Facilities Affected	Total Reports	Additional Facilities Affected	Additional Reports
4940: Water Treatment	3,310	3,310	46	3,356

**Wastewater Treatment Facilities (SIC code 4952)**

The 3,152 wastewater treatment facilities treating more than one million gallons a day are expected to meet the 10 or more FTE threshold and to report the use of chlorine. This estimate is the same for both Cases 1 and 2. Under the Revised Guidance on Otherwise Use, all of these wastewater treatment facilities are also expected to report on either an additional 19 chemicals each or an additional 40 chemicals each associated with their waste influent, depending on whether or not the

facility receives a significant amount of industrial flow. The particular chemicals that will be reported under this option will vary from facility to facility depending on the nature of the population served by the facility.

Table 2-15 summarizes the estimated reporting for SIC code 4952 under Cases 1 and 2, in addition to the Revised Guidance on Otherwise Use. SIC code 4952 is not included in the Proposed Option; therefore no reports are expected under that option.

**TABLE 2-15**

**ESTIMATED TRI REPORTING FOR SIC CODE 4952: CASES 1 AND 2,  
AND THE REVISED GUIDANCE ON OTHERWISE USE**

SIC Code	CASES 1 AND 2		REVISED GUIDANCE ON OTHERWISE USE	
	Facilities Affected	Total Reports	Additional Facilities Affected	Additional Reports
4952: Wastewater Treatment	3,152	3,152	0	65,978

**Refuse Systems (SIC code 4953)**

EPA estimates that 278 facilities would meet the 10 or more FTE threshold and would need to report under the base case for the following activities: (1) 145 Municipal Waste Combustors (MWCs) and 53 hazardous waste incinerators are expected to report on manufactured emissions of one chemical each (hydrochloric acid or sulfuric acid); (2) 71 aqueous biological/chemical hazardous waste treatment facilities are expected to report the otherwise use of one treatment chemical (chlorine) each; and (3) nine hazardous well injection facilities are expected to report the otherwise use of three chemicals: chlorine (to prevent the fouling of injection equipment and injection reservoirs by microorganisms), zinc compounds, and chromium compounds (well development purposes). This estimate is the same for both Cases 1 and 2.

Revised Guidance on Otherwise Use. The analysis determined that an additional 3,047 facilities in SIC code 4953 are expected to report under the Revised Guidance on Otherwise Use. Most of the variability in reporting attributed to SIC code 4953 under the Revised Guidance on Otherwise Use is related to whether or not a facility accepts primarily hazardous or non-hazardous wastes. For example, the hazardous waste facilities assumed to meet the 10 or more FTE threshold -- i.e., 21 hazardous waste landfills, nine hazardous injection wells, 71 biological/chemical hazardous waste treatment facilities, 53 hazardous waste incinerators, and 10 other hazardous waste TSDFs -- are all expected to report on 40 chemicals each under the Revised Guidance on Otherwise Use. In contrast, the non-hazardous waste facilities assumed to meet the 10 or more FTE threshold -- i.e., 16 ash handlers, 145 MWCs, and 3,000 Municipal Solid Waste Landfills (MSWLFs) -- are expected to report on fewer TRI chemicals associated with their waste influent. Specifically, ash handlers and MWCs are expected to report on 20 additional chemicals each, while larger MSWLFs (1,640 facilities) are expected to report on an additional 18 chemicals each and smaller MSWLFs (1,360 facilities) are expected to report on an additional 13 chemicals each. The particular chemicals that will exceed the

reporting threshold will vary from facility to facility, depending on the nature of the population served by the MSWLFs.

Table 2-16 summarizes the estimated reporting for SIC code 4953 under Cases 1 and 2, in addition to the Revised Guidance on Otherwise Use. Table 2-17 summarizes the estimated reporting for SIC code 4953 under the Proposed Option.

**TABLE 2-16**

**ESTIMATED TRI REPORTING FOR SIC CODE 4953: CASES 1 AND 2,  
AND THE REVISED GUIDANCE ON OTHERWISE USE**

SIC Code	CASES 1 AND 2		REVISED GUIDANCE ON OTHERWISE USE	
	Facilities Affected	Total Reports	Additional Facilities Affected	Additional Reports
4953: Refuse Systems	278	296	3,047	56,980

**TABLE 2-17**

**ESTIMATED TRI REPORTING FOR SIC CODE 4953: PROPOSED OPTION**

SIC Code	PROPOSED OPTION	
	Facilities Affected	Total Reports
4953: Refuse Systems	164	6,711

**Other Sanitary Systems (SIC code 4959)**

All of the 71 hazardous waste cleanup facilities with 10 or more FTEs are expected to report on one chemical each (either the manufactured emissions of either hydrochloric acid or sulfuric acid during incineration processes, or the otherwise use of chlorine during aqueous treatment). All of the 14 mosquito eradication facilities with 10 or more FTEs are expected to report on the use of one TRI pesticide (e.g., malathion). This estimate is the same for both Cases 1 and 2. In addition, under the Revised Guidance on Otherwise Use, the hazardous waste cleanup facilities are expected to report on 21 chemicals each associated with wastes received and managed at the facility.

Table 2-18 summarizes the estimated reporting for SIC code 4959 under Cases 1 and 2, in addition to the Revised Guidance on Otherwise Use. SIC code 4959 is not included in the Proposed Option; therefore no reports are expected under that option.

TABLE 2-18

**ESTIMATED TRI REPORTING FOR SIC CODE 4959: CASES 1 AND 2,  
AND THE REVISED GUIDANCE ON OTHERWISE USE**

SIC Code	CASES 1 AND 2		REVISED GUIDANCE ON OTHERWISE USE	
	Facilities Affected	Total Reports	Additional Facilities Affected	Additional Reports
4959: Other Sanitary Systems	85	85	0	1,491

**Steam and Air Conditioning Supply (4960)**

No reporting is expected from the 50 facilities in this four-digit SIC code with 10 or more FTEs for any of the options -- i.e., Cases 1 and 2, or the Revised Guidance on Otherwise Use -- because they do not appear likely to manufacture, process, or otherwise use above threshold amounts of any TRI chemicals. Furthermore, SIC code 4960 is not included in the Proposed Option; therefore no reports are expected under that option.

**Irrigation Facilities (SIC code 4970)**

There are 48 irrigation facilities in this SIC code with 10 or more FTEs. Irrigation facilities often add fertilizers to their irrigation systems to supply nutrients to the crops, and these nutrients may in limited cases be TRI chemicals such as ammonia, ammonium nitrate (solution), phosphoric acid, and zinc compounds. TRI-reportable herbicides and pesticides may also sometimes be used, and chlorine, acrolein, and copper sulfate may be used as cleaning agents. Some data indicated that irrigation facilities may also otherwise use reportable quantities of other TRI chemicals for maintenance purposes, such as methyl ethyl ketone or ethylene glycol. Based on the variety of chemicals that may or may not be used above threshold quantities at different utilities, this analysis assumed that all 48 irrigation facilities with 10 or more FTEs would report on the otherwise use of one chemical each under Cases 1 and 2. Table 2-19 summarizes the estimated reporting for SIC code 4970 under Cases 1 and 2, in addition to the Revised Guidance on Otherwise Use. SIC code 4970 is not included in the Proposed Option; therefore no reports are expected under that option.

TABLE 2-19

**ESTIMATED TRI REPORTING FOR SIC CODE 4970: CASES 1 AND 2,  
AND THE REVISED GUIDANCE ON OTHERWISE USE**

SIC Code	CASES 1 AND 2		REVISED GUIDANCE ON OTHERWISE USE	
	Facilities Affected	Total Reports	Additional Facilities Affected	Additional Reports
4970: Irrigation Systems	48	48	0	0

**Summary Reporting Estimates for SIC Code 49**

Total TRI reporting estimates for SIC code 49 for Cases 1 and 2 and the Revised Guidance on Otherwise Use are presented in Table 2-20. As was stated earlier, Cases 1 and 2 refer to separate estimates provided for two cases for reporting the constituents of fuels consumed by facilities in this SIC code: Case 1 - in which only TRI constituents above *de minimis* levels are reportable; and Case 2 - in which all TRI impurities in fuel are reportable regardless of *de minimis* levels. For the Revised Guidance on Otherwise Use, the estimates in Table 2-19 refer to the incremental number of affected facilities and expected reports as compared to Cases 1 or 2.

Table 2-21 presents the estimated reporting for SIC code 49 under the Proposed Option.

TABLE 2-20

## SUMMARY: ESTIMATED TRI REPORTING FOR SIC CODE 49

SIC Code	CASE 1		CASE 2		REVISED GUIDANCE ON OTHERWISE USE	
	Facilities Affected	Total Reports	Facilities Affected	Total Reports	Additional Facilities Affected	Additional Reports
4910: Electric Services	2,475	8,754	2,475	13,546	0	0
4920: Gas Trans./Distrib.	896	906	896	920	0	0
4930: Combin. Utilities	456	2,736	456	4,560	0	0
4940: Water Supply	3,310	3,310	3,310	3,310	46	3,356
4952: Sewerage Systems	3,152	3,152	3,152	3,152	0	65,978
4953: Refuse Systems	278	296	278	296	3,047	56,980
4959: Other Sanitary Sys.	85	85	85	85	0	1,491
4960: Steam/A-C Supply	0	0	0	0	0	0
4970: Irrigation Systems	48	48	48	48	0	0
<b>TOTAL</b>	<b>10,700</b>	<b>19,287</b>	<b>10,700</b>	<b>25,917</b>	<b>3,093</b>	<b>127,805</b>

NOTE: Case 1 retains the *de minimis* exemption for constituents of fuel. Case 2 does not apply the *de minimis* exemption to combusted constituents of fuels in SIC codes 4911, 4920, and 4930.

TABLE 2-21

**SUMMARY: ESTIMATED TRI REPORTING FOR SIC CODE 49  
UNDER THE PROPOSED OPTION**

SIC Code	PROPOSED OPTION	
	Facilities Affected	Total Reports
4910: Electric Services	518	2,831
4930: Combin. Utilities	456	2,736
4953: Refuse Systems	164	6,711
<b>TOTAL</b>	<b>1,138</b>	<b>12,278</b>

NOTE: Estimates are for Case 1. Case 1 retains the *de minimis* exemption for constituents of fuel. Case 2 does not apply the *de minimis* exemption to combusted constituents of fuels in SIC codes 4911, 4920, and 4930. Also, SIC code 4930 includes both SIC codes 4931 and 4939.

### 2.9.3 LIMITATIONS OF THE ANALYSIS

Data were limited on facilities in SIC codes 493, 496 and 497. Primary fuel types for combination utilities in SIC code 493 were assumed based on limited information, and estimates regarding typical reporting from the SIC code 491 analysis were then applied to the SIC code 493 facilities. There is also uncertainty regarding the analysis of chemicals in the waste influent of wastewater and refuse handling facilities under the Revised Guidance on Otherwise Use, based on the fact that the concentrations and volumes of TRI constituents in the waste influents to these facilities may vary over time, even at the same or similar types of facilities. To approximate Revised Guidance on Otherwise Use reporting for these facilities, a primary source of information was release data from EPA data bases. However only a fraction of the TRI chemicals could be matched in other EPA data bases. Moreover, reporting estimates calculated for the Revised Guidance on Otherwise Use are made further uncertain by the fact that TRI does not require any additional monitoring, so facilities are only required to report on chemicals about which they can reasonably be assumed to know. There is only limited information available concerning how much operators know about the TRI constituents of wastes handled by their facilities. Because the TRI program does not require monitoring to estimate emissions of toxic chemicals, many operators may not have sufficient information to complete TRI reports for many chemicals.

## 2.10 SIC CODES 50 AND 51 — WHOLESALE TRADE

### 2.10.1 DESCRIPTION OF SIC CODE

SIC codes 50 and 51 encompass wholesale trade. SIC code 50 covers durable goods and SIC code 51 includes nondurable goods. Only facilities in 10 of the four-digit wholesale SIC codes are likely to handle chemicals other than as components of manufactured articles and, therefore, possibly process TRI chemicals in quantities greater than the threshold. These potentially reporting facilities are:

- 5012 — Automobiles and Other Motor Vehicles
- 5051 — Metals Service Centers
- 5063 — Electrical Equipment
- 5093 — Scrap and Waste Materials
- 5162 — Plastic Materials and Shapes
- 5169 — Chemicals and Allied Products, not elsewhere classified
- 5171 — Petroleum Bulk Terminals
- 5172 — Petroleum Products, not elsewhere classified
- 5191 — Farm Supplies
- 5198 — Paints, Varnishes, and Supplies

The Proposed Option only includes SIC code 5169 and 5171.

## 2.10.2 PRINCIPAL ACTIVITIES AND TRI CHEMICALS

For each SIC code, the principal reportable activities and associated TRI chemicals are:

- SIC codes 5051 and 5063. Cutting metal or wire (copper, zinc, nickel, and tetrachloroethylene).
- SIC code 5093. Dismantling of automobiles for scrap (lead in batteries and ethylene glycol in radiators).
- SIC code 5162. Chemical constituents of plastics materials and shapes (methanol, methylene chloride, xylene, methyl methacrylate, cyclohexane, methyl ethyl ketone, toluene, maleic anhydride, formaldehyde, diethanolamine, styrene, trichloroethylene, n-butyl alcohol, ethylene glycol, isopropyl alcohol, methyl isobutyl ketone, methyl tert-butyl ether)
- SIC code 5169. Repackaging of wholesale chemicals (potentially almost all TRI chemicals).
- SIC codes 5171 and 5172. Distribution of petroleum products from bulk terminals and bulk plants (benzene, MTBE, xylene, toluene, n-hexane, ethylbenzene, phenanthrene, and PACs.)
- SIC code 5191. Repackaging of agricultural chemicals (ammonia for fertilizer and pesticides)
- SIC code 5198. Repackaging of paints and varnishes (isopropyl alcohol, methyl ethyl ketone, toluene, methyl isobutyl, ketone, and xylene).

### **2.10.3 RESULTS OF THE ANALYSIS**

#### **Automobiles and Other Motor Vehicles (SIC code 5012)**

Although one source indicated that refrigerated trucks would be serviced by facilities in this SIC code (suggesting that facilities in this SIC code may have to report on the TRI components of refrigerants), further research indicated that the servicing of refrigerated trucks does not typically occur in SIC code 5012. Thus, no facilities are estimated to report from SIC code 5012.

#### **Metals Service Centers (SIC code 5051)**

EPA assumed that 75 percent of service centers with 10 or more FTEs were likely to be engaged in processes such as cutting metal that could require TRI reporting. These facilities are estimated to file an average of two reports each, resulting in a total estimate that 2,570 facilities would submit 5,140 reports from SIC code 5051.

#### **Electrical Equipment (SIC code 5063)**

Most firms in this SIC code will be unaffected by TRI expansion; however, those handling wire may be affected if they cut wire. EPA estimated that 7.4 percent of facilities in this SIC code deal primarily with wire and may handle and cut wire above the threshold. These facilities are estimated to file an average of two reports each for a total estimate that 398 facilities would be required to file 797 reports from SIC code 5063.

#### **Scrap and Waste Materials (SIC code 5093)**

Scrap metal dealers, automotive wreckers, and waste oil dealers are likely to handle TRI chemicals, but only automotive wreckers are likely to use TRI chemicals above the threshold. EPA estimates that 173 facilities would file 201 reports from SIC code 5093.

#### **Plastic Materials and Shapes (SIC code 5162)**

Some facilities may be required to file TRI reports for chemical use associated with the cutting of plastics. EPA estimates that 10 percent of all facilities with 10 or more FTEs would be required to report. The average number of reports per facility is five. EPA estimated that 89 facilities would be required to file 411 reports from SIC code 5162.

#### **Chemicals, not elsewhere classified (SIC code 5169)**

Facilities in this SIC code would report on the repackaging of bulk chemicals for wholesale distribution. EPA estimates 37 percent of the facilities with 10 or more FTEs will repackage, on average, 14 chemicals above the threshold, for a total of 1,042 facilities and 14,852 reports from SIC code 5169.

### **Petroleum Bulk Terminals and Petroleum Products, not elsewhere classified (SIC code 5171/5172)**

Facilities in this SIC code would report on the processing of petroleum products and additives. All bulk terminals (SIC code 5171) are estimated to report on all eight TRI components in gasoline, No. 2 fuel oil/diesel, No. 6 fuel oil, and crude oil (see Appendix A for more details on the TRI constituents of petroleum products). Additionally, approximately 37 percent of the bulk terminals handle enough throughput to meet the 25,000-lb. threshold for TRI constituents of two bulk additives. Not all bulk plants (SIC code 5172) handle enough throughput to report on all TRI constituents in gasoline, No. 2 fuel oil/diesel, No. 6 fuel oil, and crude oil, and none handle enough product to report on additives. EPA estimates that facilities in SIC code 5172 would report on between 1 and 8 TRI constituents of petroleum products in SIC code 5172. EPA estimates total reporting from these two SIC codes as follows: 3,842 facilities and 12,398 reports from SIC code 5171, and 704 facilities and 2,018 reports from SIC code 5172.

### **Farm Supplies (SIC code 5191)**

Facilities in this industry group would report on the repackaging of pesticides and other agricultural chemicals, such as ammonia, for wholesale distribution. EPA estimates that approximately 7 percent of all facilities have 10 or more FTEs and repackage TRI chemicals above the threshold. EPA estimates that these facilities would report on an average of five chemicals each for a total of 260 facilities submitting 1,299 reports.

### **Paints, Varnishes, and Supplies (SIC code 5198)**

Repackaging of paints and varnishes will require most of the facilities in this SIC code to file TRI reports, and this analysis estimates that all facilities with 10 or more full time employees will be required to report. The average number of reports per facility is estimated to be five, for a total estimate of 833 facilities filing 4,165 reports from SIC code 5198.

### **Summary of SIC Codes 51 and 51 Reporting**

Total TRI reporting for SIC codes 50 and 51 are presented in Table 2-22. Four-digit SIC codes in which significant manufacture, processing, or use of TRI chemicals is not believed to occur were not examined in detail in the analysis and are not included in the table. Under the Proposed Option, 782 facilities in SIC code 5169 are estimated to submit 11,139 chemical reports and 3,842 facilities in SIC code 5171 are estimated to submit 12,394 reports.

TABLE 2-22

## ESTIMATED TRI REPORTING FOR SIC CODES 50 AND 51

SIC Code	Number of Facilities With 10 or More FTEs *	Number of Facilities Reporting	Total Number of Reports
5051	3,663	2,570	5140
5063	5,384	398	797
5093	2,850	168	196
5162	888	89	444
5169**	2,801	782	11,139
5171**	3,842	3,842	12,394
5172	1,085	685	2,018
5191	3,930	345	1,428
5198	833	377	1,883
<b>TOTAL</b>	<b>25,276</b>	<b>9,256</b>	<b>35,439</b>

\*The number of facilities with 10 or more FTEs is also the number of facilities making a compliance determination.

\*\*Indicates SIC codes included in the Proposed Option. Total reporting under the Proposed Option for SIC codes 50/51 is 4,624 facilities and 23,533 reports.

#### 2.10.4 LIMITATIONS OF THE ANALYSIS

The estimates of the number of facilities reporting TRI chemicals and the number of chemicals reported per facility for SIC codes 5169 and 5191 are based on largely limited data consisting of a survey of eight and nine facilities, respectively, and state TRI data, where available. The limited total number of facilities from which to extrapolate compromises confidence in the accuracy of the estimated number of facilities reporting and the average number of chemicals reported per facility.

The estimated number of reports for SIC codes 5171 and 5172 are based on limited information about the chemical constituents of petroleum products and petroleum additives, the distribution of petroleum products at facilities, and levels of throughput. Additional information could affect the actual number of reports received from these two SIC codes.

Estimates of the number of chemicals reported per facility for SIC codes 5051, 5063, and 5198 are based on analysis of EPCRA Section 312 data from the state of Washington. The reporting requirements for EPCRA Section 312 differ from TRI (EPCRA Section 313) requirements and may not accurately reflect the universe of facilities and activities that will be required to report to EPCRA Section 313.

Estimates of the percent of facilities reporting for SIC codes 5051, 5063, 5162, and 5198 are based on limited information collected from examination of EPCRA Section 312 data from states and limited conversations with industry personnel. Because the estimates presented in this analysis were generated from a modest number of data points, the actual number of facilities reporting could differ.

## **2.11 SIC CODE 7389 — SOLVENT RECOVERY SERVICES ONLY**

### **2.11.1 DESCRIPTION OF SIC CODE**

SIC code 7389 includes over 130 different activities including bronzing baby shoes, filling pressurized containers, servicing fire extinguishers, labeling of bottles and cans, providing solvent recovery services, and swimming pool cleaning and maintenance. This analysis focuses on facilities that offer solvent recovery services, which are included in the Proposed Option. According to the National Association of Chemical Recyclers, there are approximately 50 U.S. facilities whose primary business is solvent recovery. There are also 100 independent treatment, storage, or disposal facilities (TSDF) that perform some form of solvent recovery although many use the contaminated solvents for fuel blending.

### **2.11.2 PRINCIPAL ACTIVITIES**

During normal use, industrial solvents become contaminated with dissolved materials. Solvent reclamation or recovery is the process of renewing a spent or contaminated solvent to a condition suitable for reuse. Solvent recovery often occurs on-site at manufacturing facilities, but also is contracted to off-site solvent recovery services.

The principal activities in solvent recovery center around conventional and more innovative technologies that involve physical and chemical separation. Such activities include distillation, air stripping and steam stripping, fractionation, adsorption on carbon beds, mechanical separation (e.g., filtration), condensation, and absorption. These activities frequently involve TRI chemicals.

### **2.11.3 TRI CHEMICALS**

Solvents appropriate for recovery include alcohols, aliphatics, aromatics, chlorinated hydrocarbons, chlorofluorocarbons, ketones, and other flammable and non-flammable solvents typically contaminated with chemicals, paint, ink, resin, oil, grease, metal or dirt. Many of these solvents are TRI chemicals. Waste contaminants (e.g., metals) isolated from the solvent may also be TRI chemicals, however, these are not usually found in large enough quantities to trigger TRI reporting.

### **2.11.4 RESULTS OF THE ANALYSIS**

Because recovery of solvents is considered to be most economical when performed on a large scale, most facilities that recycle such solvents are estimated to process that solvent in quantities greater than 25,000 pounds per year. Based a survey of eight facilities, the TRI chemicals that are processed and meet the threshold reporting requirements are: carbon tetrachloride, chloroform, chlorofluorocarbons, methanol, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, perchloroethylene, toluene, 1,1,1-trichloroethane, trichloroethylene, xylene, and n-methyl-2-pyrrolidone.

Extrapolating from the percentage of facilities in the limited survey reporting at least one TRI chemical and the average number of chemical reports per affected facility yields an estimate of 17 affected facilities in SIC code 7389. These facilities are estimated to submit a total of 85 chemical reports, as shown in Table 2-23. These estimates also apply to the Proposed Option.

**TABLE 2-23**

**SUMMARY OF ANALYSIS OF SOLVENT RECOVERY IN SIC CODE 7389**

<b>Number of Affected Facilities</b>	<b>Average Number of Reports per Facility</b>	<b>Total Reports</b>
17	5	85

**2.11.5 LIMITATIONS OF THE ANALYSIS**

The principal limitation of the analysis for SIC code 7389 is the small number of facilities surveyed. In addition, many other facilities are known to recover solvents but are listed in other SIC codes because solvent recovery is not the facility's principal business activity.

**2.12 SUMMARY OF THE ESTIMATES**

The total number of affected facilities and number of TRI reports estimated in this analysis are presented in Tables 2-24 and 2-25. Table 2-24 presents estimates for the base case under the three options pertaining to the extraction of natural resources, which affect the estimates for SIC codes 10 and 12.<sup>15</sup> Although extraction of natural resources also affects SIC code 14, the analysis estimates no reporting of TRI chemicals in extracted ore. Table 2-25 presents estimates for the Revised Guidance on Otherwise Use; these estimates are presented as incremental to the estimates shown in Table 2-24. The incremental number of affected facilities is small compared to the additional number of reports under both options because almost all of the additional TRI reports are estimated to be submitted by facilities already reporting under Options 1, 2, or 3.

As shown in the table, SIC codes 42, 49, and 50/51 account for the majority of affected facilities under all three options. Pipeline facilities in SIC code 46 are not expected to submit any TRI reports, and several other SIC codes will have relatively few affected facilities. Further, facilities in SIC codes 42, 49, and 50/51 are estimated to submit most of TRI chemical reports projected in this analysis.

The Proposed Option is presented in Table 2-26. Under the Proposed Option, the majority of affected facilities are in SIC code 5171 and the greatest number of reports are expected from facilities in SIC codes 5169 and 5171. Tables 2-27 through 2-30 provide additional information about the percent of facilities in an SIC code that are estimated to be affected under the various options and the range of reports to be submitted.

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<sup>15</sup> Estimates for SIC code 49 are presented for Case 1, in which the *de minimis* exemption applies to TRI constituents of fuels burned at these facilities.

**TABLE 2-24**  
**TOTAL ESTIMATED TRI REPORTING**

<b>SIC Code</b>	<b>OPTION 1</b>		<b>OPTION 2</b>		<b>OPTION 3</b>	
	<b>Estimated Number of Affected Facilities</b>	<b>Estimated Number of Reports</b>	<b>Estimated Number of Affected Facilities</b>	<b>Estimated Number of Reports</b>	<b>Estimated Number of Affected Facilities</b>	<b>Estimated Number of Reports</b>
10	281	654	328	1,176	328	2,522
12	321	642	321	642	1,749	9,984
14	427	508	427	508	427	508
40	731	2,112	731	2,112	731	2,112
42	26,415	49,544	26,415	49,544	26,415	49,544
45	824	984	824	984	824	984
46	0	0	0	0	0	0
47	155	440	155	440	155	440
49*	10,700	19,287	10,700	19,287	10,700	25,917
50/51	9,256	35,439	9,256	35,439	9,256	35,439
7389	17	85	17	85	17	85
<b>TOTAL</b>	<b>49,127</b>	<b>109,695</b>	<b>49,174</b>	<b>110,217</b>	<b>50,602</b>	<b>127,535</b>

\* The estimates presented for SIC code 49 under Options 1 and 2 correspond to Case 1. The estimates presented under Option 3 correspond to Case 2. While Cases 1 and 2 result in different estimates for SIC code 49, Options 1, 2, 8 and 3 do not because extraction does not occur in this industry.

TABLE 2-25

**ESTIMATED INCREMENTAL REPORTING UNDER  
THE REVISED GUIDANCE ON OTHERWISE USE**

SIC Code	REVISED GUIDANCE ON OTHERWISE USE	
	Estimated Additional Number of Affected Facilities	Estimated Additional Number of Reports
10 - Metal Mining	0	0
12 - Coal Mining	0	0
14 - Nonmetal Mining	0	0
40 - Railroads	0	0
42 - Trucking/ Warehousing	111	11,041
45 - Air Transportation	0	0
46 - Pipelines	0	0
47 - Transportation Services	0	0
49 - Electric/Gas/ Sanitary Services	3,093	127,805
50/51 - Wholesale Trade	0	0
7389 - Solvent Recovery Only	0	0
<b>TOTALS</b>	<b>3,204</b>	<b>138,846</b>

Note: The estimates presented in this table are incremental to the level of reporting estimated under Options 1, 2, and 3.

TABLE 2-26

## TOTAL ESTIMATED TRI REPORTING UNDER THE PROPOSED OPTION

SIC Code	PROPOSED OPTION	
	Estimated Number of Affected Facilities	Estimated Number of Reports
10 - Metal Mining	328	1,176
12 - Coal Mining	321	642
4911, 4930 - Electric and Combined Utilities	974	5,567
4953 - Refuse Systems	164	6,711
5169 - Chemicals and Allied Products	782	11,139
5171 - Petroleum Bulk Terminals	3,842	12,394
7389 - Solvent Recovery Only	17	85
<b>TOTALS</b>	<b>6,428</b>	<b>37,714</b>

TABLE 2-27

**SUMMARY OF ESTIMATED NUMBER OF AFFECTED FACILITIES AND CHEMICAL  
REPORTS: PROPOSED OPTION**

<b>SIC Code</b>	<b>Total Number of Facilities</b>	<b>Total Number of Facilities with 10 or More Employees</b>	<b>Total Number of Affected Facilities</b>	<b>Coverage of Facilities with 10 or More Employees</b>	<b>Total Number of Reports</b>	<b>Range of Reports Per Facility</b>	<b>Average Number of Reports per Facility</b>
10	842	328	328	100%	1,176	1-10	4
12	3,312	1,749	321	18%	642	1-2	2
4911/4931 /4939	1,229	974	974	100%	5,567	3-6	6
4953	164	164	164	100%	6,711	40-43	41
5169	9,014	2,801	782	28%	11,139	1-27	14
5171	10,292	3,842	3,842	100%	12,394	1-10	3
7389	40	17	17	100%	85	1-10	5
<b>TOTAL</b>	<b>24,943</b>	<b>9,875</b>	<b>6,428</b>	<b>65%</b>	<b>37,714</b>		<b>6</b>

TABLE 2-28

**SUMMARY OF ESTIMATED NUMBER OF AFFECTED FACILITIES AND CHEMICAL  
REPORTS: OPTION 1**

SIC Code	Total Number of Facilities	Total Number of Facilities with 10 or More Employees	Total Number of Affected Facilities	Coverage of Facilities with 10 or More Employees	Total Number of Reports	Range of Reports Per Facility	Average Number of Reports per Facility
10	1,060	404	281	70%	654	1-7	2
12	3,312	1,874	321	17%	642	1-2	2
14	5,409	2,510	427	17%	508	1-4	1
40	1,576	1,339	731	55%	2112	1-3	3
42	98,134	28,281	26,415	93%	49,544	1-9	2
45	9,631	4,489	824	18%	984	1-9	1
46	4,200	420	0	0%	0	NA	0
47	42,520	7,830	155	2%	440	1-4	3
49	86,451	14,637	10,700	73%	19,287	3-11	2
50/51	470,666	145,444	9,256	6%	35,439	1-27	4
7389	40	17	17	100%	85	1-10	5
<b>TOTAL</b>	<b>725,999</b>	<b>207,245</b>	<b>49,127</b>	<b>7%</b>	<b>109,695</b>		<b>2</b>

TABLE 2-29

**SUMMARY OF ESTIMATED NUMBER OF AFFECTED FACILITIES AND CHEMICAL  
REPORTS: OPTION 2**

<b>SIC Code</b>	<b>Total Number of Facilities</b>	<b>Total Number of Facilities with 10 or More Employees</b>	<b>Total Number of Affected Facilities</b>	<b>Coverage of Facilities with 10 or More Employees</b>	<b>Total Number of Reports</b>	<b>Range of Reports Per Facility</b>	<b>Average Number of Reports per Facility</b>
10	1,060	404	328	81%	1,176	1-10	4
12	3,312	1,874	321	17%	642	1-2	2
14	5,409	2,510	427	17%	508	1-4	1
40	1,576	1,339	731	55%	2,112	1-3	3
42	98,134	28,281	26,415	93%	49,544	1-9	2
45	9,631	4,489	824	18%	984	1-7	1
46	4,200	420	0	0%	0	NA	0
47	42,520	7,830	155	2%	440	1-4	3
49	86,451	14,637	10,700	73%	19,287	1-11	2
50/51	470,666	145,444	9,256	6%	35,439	1-27	4
7389	40	17	17	100%	85	1-10	5
<b>TOTAL</b>	<b>725,999</b>	<b>207,245</b>	<b>49,174</b>	<b>24%</b>	<b>110,217</b>		<b>2</b>